Department of Political and Social Sciences

Controversies, Public Engagement, and Scientific Expertise in Technical-Scientific Decision-Making Processes

The Setting up of Household Waste Incinerators in France

Christophe Voineau

Thesis submitted for assessment with a view to obtaining the degree of
Doctor of Political and Social Sciences of the European University Institute

Florence, March 2010

EUROPEAN UNIVERSITY INSTITUTE
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"The major justification for the research enterprise is that we [the researchers] have the time and the skills to develop approximations of the truth that have a firmer warrant than common sense."

(Firestone W. A., 1990, p. 123)

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ABSTRACT

This thesis presents analyses of (i) the public involvement in decision making processes in local government, and of (ii) the mobilisation of scientific expertise by the public engaged in these processes. The theoretical perspective of this research is at the intersection of Science Studies and Political Sciences. The Science Studies perspective is, however, clearly predominant.

This research, based on semi-open interviews, is empirical and the cases selected are decision-making processes with a strong technical-scientific dimension. More precisely, the cases selected are ten recent decision-making processes for the setting-up of incineration plants in France: the decision-making processes selected ended between 2003 and 2005. Beyond the empirical research, the research intends to improve existing theories and to provide novel concepts for the analysis of the public engagement and the mobilisation of scientific expertise by the public.

Part (i) shows that, in spite of the numerous legal possibilities that the local public authorities have, the level of public engagement was low. There was therefore very little political will to engage the public. The analysis suggests that an early participation sponsored by the public authority may diminish the degree of controversy of a decision-making process, whereas consultation is less likely to reach this goal. Finally, it seems that a high level of communication initiatives sponsored by the local NGOs is likely to lead to the abandonment of the incineration plant project.

Part (ii) shows that local NGOs may make positive contributions to public decision-makings, widening the issue under discussion, and bringing alternative valid scientific and technical expertises. Therefore, the analysis support the position hold by many Science

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Studies scholars who claim that public participation is likely to improve the quality of the overall expertise delivered to decision-makers. The analysis is also an agreement with a fairly positive view of NIMBY, which supports that the public may have a good grasp of and reasonable concern for health and welfare which are ignored by technical and administrative elites. Finally, the analysis supports the position hold by the '*critical*' Public Understanding of Science scholars, that is, that the public is able to reflect on the source of their knowledge.

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PART III

PUBLIC MOBILISATION OF SCIENTIFIC EXPERTISE

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INTRODUCTION

This thesis presents analyses of (i) the public involvement in decision making processes in local government, and of (ii) the mobilisation of scientific expertise by the public engaged in those processes. The theoretical perspective of this research is at the intersection of Science Studies and Political Sciences. The Science Studies perspective is, however, clearly predominant.

This research is empirical and the cases selected are decision-making processes having a strong technical-scientific dimension. More precisely, the cases selected are ten recent decision-making processes for the setting-up of incineration plants in France: the decision-making processes selected ended between 2003 and 2005

Because this research is twofold, the dissertation has been structured in nine chapters distributed in three parts. Part I is kind of 'introductory' part for the two other parts; it is made up of three chapters. In chapter 1, the (science study) literature on the use of scientific expertise in public decision-making processes is reviewed and the six research questions which stem from this literature review are presented. Concerning public engagement, these are: "1. to what extent is the public actually involved in decision-making processes?"; "2. how strong is the political will to involve the public?"; "3. what is the impact of the public engagement on the decision-making processes (i.e. on their degree of controversy, and on their outcome)?" Concerning the mobilisation of scientific knowledge by the public, the two first research questions tackle the sources of scientific knowledge mobilised by the public: "4. To what extent does local NGOs seek scientific expertise; what are their sources?"; and "5. what are the reasons invoked by the local NGOs for not mobilising scientific expertise?" The

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third question deals with the use of scientific knowledge in the discourses of the public: "6. Is scientific knowledge a key argument in the discourses of the public; what are the other types of arguments that the public employs to gain *credibility*?" Chapter 2 deals with the selection of the cases and its social and academic justifications, and with the main lines of the methodology, which is mainly qualitative. Finally, chapter 3 gives an overview of chronological structure of the selected decision-making processes, and provides an analytical description of the actors involved, detailing the structuring of the mobilisation of the NGOs which engaged.

Part II deals with the public engagement in the selected decision-making processes. Chapter 4 sets up the theoretical framework, and details the methodology used to collect and treat the data. In chapter 5, the legal framework of the public engagement is set up. Chapter 6 then attempts to answer the three research questions which deal with the public engagement.

In Part III, I analyse the mobilisation of scientific expertise by the public. To be more precise, in this part of the research I have limited my study of the public to the locally engaged NGOs. Chapter 7 outlines the theoretical framework and details the methodology used while chapter 8 deals with the sources of scientific expertise of the NGOs and chapter 9 with the use of scientific expertise in the discourses of the NGOs. An introduction can be found at the beginning of each part; these introductions notably detail the structuring of the parts, respectively.

As the structure detailed above shows, part II and part III have their own theoretical framework in addition to the overarching framework presented in Part I. While the data collection methods, based mainly on semi-open interviews, are similar, the data treatment methods are very different. This is the reason why the methodology is explained in three steps: in part I the main lines are stated, then more details are given the respective theoretical chapters, and finally, possible necessary technical details are provided as the data analyses are made.

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PART I

SCIENTIFIC EXPERTISE
AND
PUBLIC DECISION-MAKING

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INTRODUCTION

This part sets up the common framework of this twofold research. Chapter 1 is a kind of introductory chapter in which the (Science Study) literature is reviewed and the research questions about public engagement, on the one hand, and about public mobilisation of scientific expertise, on the other, are put forward. Chapter 2 introduces the main lines of the methodology used in this research. In this chapter, I also provide a discussion of the selection of the cases, that is, about the selection of the setting up of waste incineration plants as object of this research. The selection of ten decision-making processes for this multiple cases study is also discussed. Finally, in chapter 3 I provide a detailed but non-analytical description of the chronological structure of the studied decision-making processes. The actors engaged in the decision-making processes, notably the local public authorities and the public, are detailed, and an analytical description of the mobilisation of the (local) NGOs is provided.

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Chapter 1
Traditional Scientific Expertise is not Enough

Over the past forty years, western democracies have increasingly based their public decision-making on scientific expertise. However, relationships between power and scientific knowledge are now changing. Until the 1990's the use of scientific expertise in technical-scientific public decisions was not really questioned, at least not in the Science Studies field. Scientific expertise used to work as *"speaking truth to power"* (Price Don K., 1965). The process of the expert "speaking truth to power" can be roughly described as follows: when politicians were facing a problem involving technical-scientific aspects, they turned toward scientists to provide the answers; scientists analysed the problem and gave their "objective scientific advice"; then, politicians based their decision on this scientific-technical advice and thus, could claim that they objectively made the best possible decision. When those decisions did not turn out for the best, politics had the possibility to deflect their responsibility onto a technical failure.

By '*technical-scientific public decision-making*' I mean "*decision-making at those points where science and technology intersect with the political domain because the issues are of visible relevance to the public: should you eat British beef, prefer nuclear power to coal-fired power stations, want a quarry in your village, accept the safety of anti-misting kerosene as an airplane fuel, vote for politicians who believe in human cloning, support the Kyoto agreement, and so forth*" (Collins H.M. and Evans R., 2002, p. 236).

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However, the 1980's and 1990's have been a turning point for the relationship between power and scientific expertise. Many scandals arose around issues of risks and expertise, including: Bovine Spongiform Encephalopathy (BSE, also called 'mad cow disease') in the U.K and then in Europe; the culture of Genetically Modified Organisms (GMOs) crops in the U.S.A and in Europe; the contamination of cow's milk by dioxins produced by waste incinerators in France; the contamination of transfusion blood by AIDS in France; or the radioactive pollution following the Chernobyl accident, and in particular the radioactive cloud which officially stopped at the French border. At the same time, many societal-technical controversies have also broken out concerning the global climate change, the water pollution by chemicals, or the territory management such as the sitting of nuclear power plants, nuclear waste disposals, railway lines, or waste incineration plants. Following these technical-scientific and social controversies, the role of scientific expertise in public decision-making has been under discussion in the western democracies. And some top-down changes occurred; for example in France, a series of state agencies have been set up in order to provide independent public expertise. In 1998, three agencies were created: INVS to reinforce the general sanitary monitoring, AFSSA to monitor products intended to human use, such as foodstuffs, and AFSSAPS to monitor the health products. And in 2001 the French parliament voted in favour of the creation of AFFSSE, an agency put in charge of monitoring the environmental hazards to human health.

In this context, in the 1990's-2000's, many Science Studies scholars have analysed the use of traditional scientific expertise in technical-scientific public decision-makings. From here onward, the term 'traditional' has been linked to the technocratic way of making decisions: roughly speaking, experts produce their expertise within their scientific community, and then they communicate their final report to the decision-makers. 'Traditional scientific expertise' is thus distinct from the innovative experiences in which the public is involved, such as consensus conferences, or focus groups. Moreover the terms *'scientific'* and *'science'* refer to the natural sciences, such as physics, chemistry, biology; this research does not deal with other domains of expertise such as the economy. Science Studies scholars have reached the conclusion that traditional scientific expertise actually encounters many problems. But they also propose some solutions for solving these problems.

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I. The Problems of Traditional Scientific Expertise: The Science Studies Analysis

Science Studies scholars implicitly do not question the fact that scientific expertise is a foundation stone for the functioning of modern democracy. However, they have severely contested the way it is used, and the neat boundaries drawn between science, society and politic. They no longer consider that the conception of scientific expertise as "speaking truth to power" is valid. Traditional scientific expertise is not able to solve risk problems on its own: scientific expertise is not enough. The Science Studies scholars who claim that scientific expertise has failed invoke two main reasons: scientific expertise is not as positive as science is, and experts do not stand apart from values and personal interests.

I.1. Traditional Scientific Expertise Is Not As Positive As Science Is

Scientific expertise is not as positive as science is for three reasons. To begin with, according to H. Nowotny, experts are forced to transgress the limits of their competencies because scientists, when acting as experts, have to solve problems they have not chosen (Nowotny H., 2003). In particular, in the case of crisis, scientists are nimbly asked to provide solutions or at least reliable information: they are consequently under pressure. Thus, if the available knowledge is not sufficient, they tend to transgress the boundaries of their discipline and the limits of their own knowledge. Even if uncertainties are omnipresent, decisions are to be taken and so scientists feel obliged to provide answers, at any cost. In other words, once a scientist has accepted the role of expert, he must give definite answers, frequently more definite than the state of the knowledge actually allows. In fact, as Helga Nowotny claims "*the right of experts to say in public "we do not know has been won only recently, as the consequence of public scandals that have led to a break with ignoble silence or overt lying*" (Nowotny H., 2003, p.152).

Secondly, to be really valid, scientific expertise should understand the interactions between scientific knowledge, institutions, local context and the practices of the diverse actors (Nowotny H., 2003; Funtowicz S. and Ravetz J., 1992). Even in cases where there is no uncertainty about scientific knowledge, traditional expertise is transgressive because no risk issue is solely scientific or technical. Yet it is hardly possible for scientific expertise to act in an open field and thus to deal with the complexity of the real natural and social world, because science has historically drawn its strength from the isolation of the laboratories. Since

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the 18th century, researchers have been substituting the great world of the common experience, the macrocosm where we live, with the microcosm of the well-equipped laboratories: laboratories are the tool which allow researchers to grasp and manipulate the macrocosm by simplifying and reducing it (Callon M., Lascoumes P. Barthe Y., 2001).[1]

Thirdly, in order to reach a consensus among them, scientific experts frame the domain of relevance of the problem according to their own specialised discipline. Once this boundary-work[2] of relevance is realised, they consider as scientific what is inside the domain and as politic or values what lies out-side it. Consequently, scientists may exclude important aspects from their expertise; the gain in rigor is balanced by an imaginative narrowness. Thus scientific expertise is not neutral; it is an error to consider that scientists merely answer the questions asked by politics, using their special skills or superior knowledge. By this process of framing, they have the political power to decide the very terms of the deliberation. (Jasanoff S., 2003). Sheila Jasanoff insists on the importance of the activity of framing because *"expertise often does not pre-exist the disputes the experts are summoned to settle, but is contingency produced within the very context of disputation. Expertise is not so much found as made in the process of litigation or other forms of technical decision-making"* (Jasanoff S., 2003, p. 159, see also Jasanoff S., 1995a and Goodwin, 1994).

I.2. Experts Do Not Stand Apart From Values and Personal Interests

Not only is objective scientific knowledge alone unsuitable for grasping the complexity of the real world, experts do not stand apart from values and personal interests. To begin with, when traditional scientific expertise is value laden, that is, when acting as experts, what scientists *"are doing is not 'science' in an ordinary sense, but a hybrid activity that combines elements of scientific evidence and reasoning with large doses of social and political judgment."* (Jasanoff, S, 1990, p. 229; see also Nowotny H., 2003; Jasanoff S. and Lynch M., 1998; Funtowicz S. and Ravetz J., 1992). In other words, traditional scientific expertise is not

[1] Michel Callon, Yannick Barthe and Pierre Lascoumes consider scientific research to act in three steps called "traduction." "Traduction 1" is the reduction from the real world (macrocosm) to the little world of the laboratories (microcosm). "Traduction 2" is the work of the researchers who explore simplified objects using the huge concentration of instruments and competencies of the laboratories. The last step, "traduction 3," is the always perilous return to the real world: will the knowledge and machines produced in the confined spaces of the laboratories survive in it?

[2] The concept of 'boundary work' was developed by Gieryn (Gieryn T. F., 1983; Gieryn T. F., 1999c; Gieryn T.F., 1995), and first applied by Sheila Jasanoff (Jasanoff S., 1987, and Jasanoff, S, 1990). See chapter 7, sub-section IV.2 for further details.

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objective; it incorporates many popular conceptions and personal values. The conclusions of scientific expert evaluations often depend on the social positions and interests of the experts who produce them. This diversity of conclusions reflects the commitment of the diverse stake-holders and policy-makers. In other words, value judgments are notably acting during the experts' work of boundary, when they decide what is relevant and what is not (Jasanoff, S, 1990; Irwin A. and Wynne B., 1996). It is very difficult for an expert not to bias his conclusions by personal values because he is dealing with issues that involve the society in which he, his family, and his friends all live. When acting as experts, scientists leave their isolated laboratories to immerse themselves in the society.

Traditional scientific expertise may also be affected by personal interests and financial dependence. Indeed, an expert is often firstly a researcher and the financing of his research, and thus his career, depends on public authorities and on important economic groups. Many researchers can feel (or are) obliged to provide a scientific expert evaluation which does not bother too much some current or potential future financiers; very few researchers can be totally independent when acting as experts (Jasanoff, 1990).

According to Sheila Jasanoff, these criticisms of traditional scientific expertise seem to be shared by the scientists themselves in the U.S.A (See Jasanoff, S, 1990, p. 229). The situation appears to be similar in France, for example during the meeting "Environnement: expertise, science et société du 15 juin 2000," the director of the French Centre National de la Recherche Scientifique declared:

> *"Who could deny that from identical scientific conclusions, two researchers react in a different way according to their personal sensibility and consciousness?"* [3]
>
> (Brechignac C., 2000)

and the director of the Institute Pierre Simon Laplace des sciences de l'environnement global stated:

> *"Neither witness, neither wise, he (a scientist who is acting as an expert) must be aware that science is not necessarily at the heart of the debate."* [4]
>
> (Megie G., 2000)

[3] Original version: "qui pourrait nier qu'à partir de conclusions scientifiques identiques, deux chercheurs réagissent différemment en fonction de leur sensibilité et de leur conscience personnelles?"
[4] Original version: "ni témoin, ni sage, il [le scientifique agissant comme expert] émet un avis et doit prendre conscience que la science n'est pas nécessairement l'élément essentiel du débat."

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To sum up, the fact that experts do not act entirely free from values, and personal interests, and that traditional scientific expertise is not enough, has lead to the multiplicity of scientific expertises and counter expertises. Sheila Jasanoff suggests that decision-makers (in the United States) have exploited this multiplicity of scientific expertise to serve their own pre-defined goals through the selection of *ad hoc* experts or expertise:

> *"an uncritical and theoretically uninformed discourse of expertise has fostered both an instrumental attitude toward experts on the part of government and relatively weak demands for accountability from citizens."*
>
> (Jasanoff S., 2003Jasanoff S., 2003, p.158)

I.3. Discrepancy between expectations and the reality of traditional scientific expertise

To conclude, many Science Studies scholars agree that traditional scientific expertise is in crisis. They implicitly argue that the origin of the crisis is the discrepancy between what is expected from scientific experts and the reality of the traditional expertise. By *'scientific expert'* I mean: a mediator between science and society who is summoned to rapidly solve problems that society is facing by using his special scientific skills. It is expected that scientific experts behave as if they would be "ideal" 'scientific engineers'[5] able to rapidly provide the 'objective best solution', whereas they are advisers, who have their restricted domain of competencies, who may make value judgements, who are fallible and who have personal interests. Moreover, at best experts are 'scientific researchers'[6] who deal with uncertainties and who need time to go further. This discrepancy between the expectations and the reality of traditional scientific expertise, and thus the arguments developed in the two previous sections have been summarized in the figure 1 below, which has been inspired by Jacques Theys (Theys J., 2000).

[5] By 'scientific engineer', I mean a professional who uses certified and objective scientific knowledge in his daily activities. In Khunian terms, he works with (very well) established paradigms. Due to his special skills, a scientist is expected to be the most efficient person to close a controversy: he is supposed to be competent, impartial and rapid. In other words, scientists are considered according to Merton's norms: universalism, communism, disinterestedness and organised scepticism.

[6] By 'scientific researcher' I mean a scientist who is at the frontiers of the well established knowledge, and who has to be imaginative in order to create new knowledge. A 'scientific researcher' has to deal with uncertainties, and he needs time to produce new knowledge. Finally, if necessary, a scientific researcher can discuss a paradigm and build a new one.

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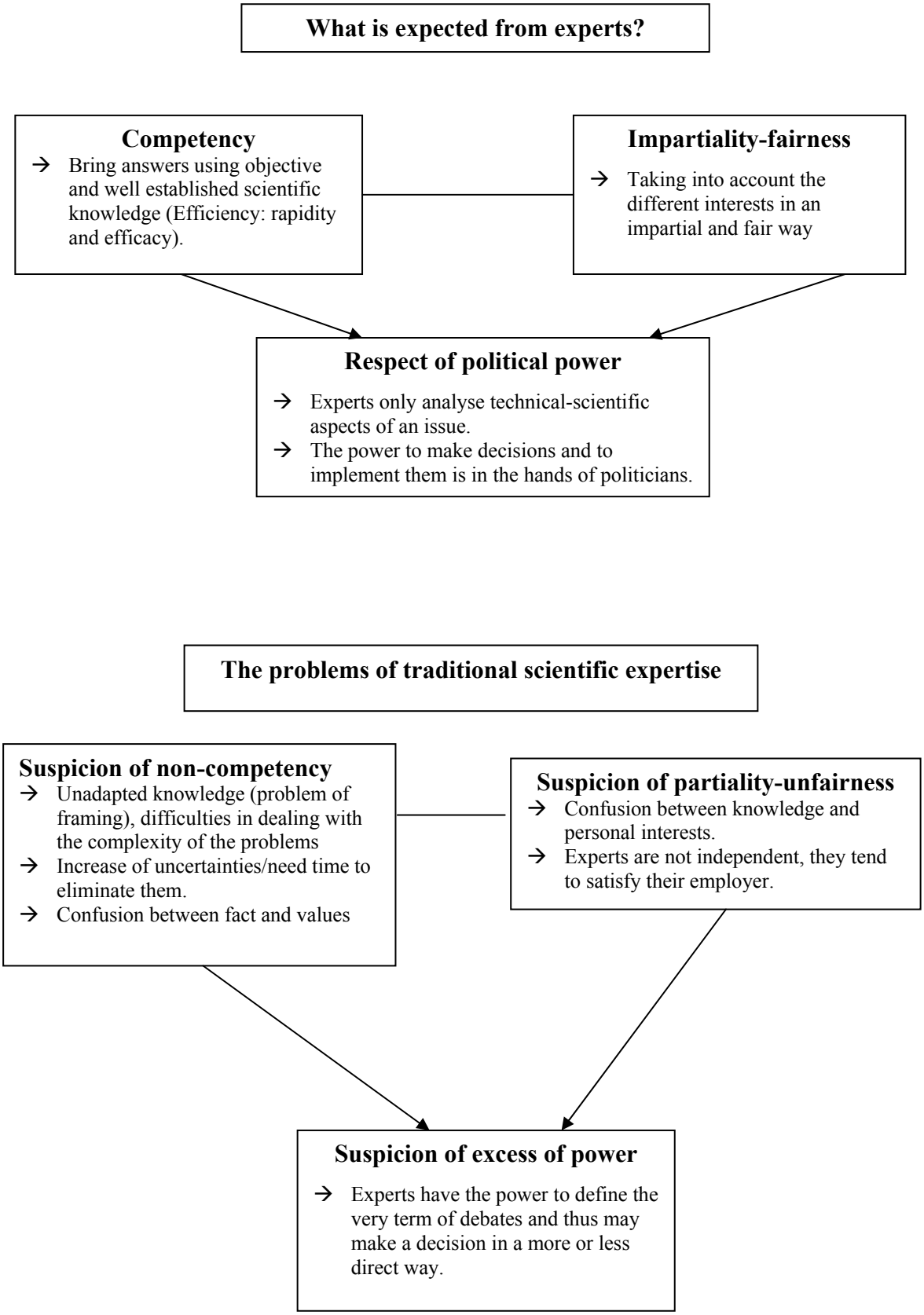
Figure 1: Discrepancy between the expectations from experts and the actual problems of traditional scientiific expertise



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This discrepancy, however, may appear as a caricature of the traditional scientific expertise. I do not claim, that all the experts are *'non competent'*, *'partial'*, or that they *'exceed their power'*, that is, that the traditional scientific expertise does not work at all. I claim, rather, that in the light of the various scandals of the 1980's and 1990's and of the analysis made by Science Studies scholars, there is a suspicion of *'non-competency'*, a suspicion of *'partiality-unfairness'*, and a suspicion of *'excess of power'*.

II. Solutions to Solve the Problems of Traditional Scientific Expertise

To solve the problem of traditional scientific expertise, Science Studies scholars propose two solutions: the precautionary principle for facing scientific uncertainties; and the involvement of the public to counter the possible non-competency, partiality, and excess of power of scientific experts.

II.1. Facing Uncertainties: The Precautionary Principle

The precautionary principle has become very popular, and is often invoked by diverse social actors to defend their interests and by journalists. Its meaning has consequently been transformed and manipulated and is thus not always clear. Apart these more or less fair uses of the precautionary principle, many 'official' and legal definitions can be found (see Morris J., 2002, p.1-21). The precautionary principle has been traced to the German principle of 'foresight-planning' (*Vorsorgeprinzip*), a founding principle of German environmental policies during the 1970's. It later became a cornerstone of international environmental co-operation, first used at the Second International Conference on the Protection of the North Sea in 1987. The precautionary principle can be briefly formulated as follows: in case of doubt over the potential serious or irreversible consequences of a 'technical-scientific object' (for example the use of a new chemical, the introduction of a GMO in agriculture), protective measures must be taken (for example forbidding the use of the chemical, forbidding the use of the GMO open fields) and at the same time experts must be asked to search for conclusive scientific evidence of the innocuousness of the object. Thus, the precautionary principle allows experts to deal with knowledge uncertainties; they are no longer summoned to give an immediate answer, they can say "We don't know, we need time to go further in the research". In other words the precautionary principle gives time to scientists to find conclusive evidence.

The precautionary principle must not be confused with 'prevention'. The former is used in case of uncertainties about the dangers and asks science for more information, whereas in the case of the latter dangers are identified. This confusion is linked to another one made between

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uncertainties and risks. In the case of risk, the probability of an event's occurrence and its negative consequences are established – the dangers are known, whereas in the case of uncertainties neither the probability nor the consequences of the danger are known – there is merely a suspicion about the existence of dangers.

II.2. Public Involvement

Numerous Science Studies scholars agree that the public should be involved in the technical-scientific public decisions, and should be considered as complementary to both scientific advice and systems of political representation. The positions of these scholars can be summarised by the position of Evans and Plows, who argue that *"more heterogeneous participation and debate have the potential to improve the scrutiny and accountability of science within representative democracies"* (Evans, Robert and Plows, Alexandra, 2007, p. 827). The main goal of public involvement put forward by these scholars is that scientific expertise has to be widened in order to answer the complexities of the social and the political world, that is, that decision-making has to incorporate 'non-standard' knowledge in the governance of risk (Wynne B., 1992a; Fischer F., 1999; Weale A., 2001; Callon M., Lascoumes P. Barthe Y., 2001; Nowotny H., Scott P. Gibbons M., 2001; Nowotny H., 2003; Jasanoff S., 2003; Grundmann R. and Stehr N., 2003; Dietrich H., Schibeci R., 2003).

Frank Fisher, for example, puts it this way when he argues for a 'participatory expertise':

> *"There is not only a place for citizen input in socio-technical investigation, but a need for it. While citizens may not be capable of judging the complex technical calculations (and are seldom interested in trying to) they are able to offer valuable thoughts and judgments about the social assumptions and contextual interpretations that go into the mix."*
>
> (Fischer F., 1999, p. 301; see also Fischer F., 1990)

For Brian Wynne (1992), the public's expertise in relation to matters of ignorance resides in its ability to decide to whom to extend trust and confidence. In other words the public has the ability to broaden the frame of a given the problem. Furthermore, he argues that *"science offers a framework that is unavoidably social as well as technical since in public domain scientific knowledge embodies implicit models or assumptions about the social world"* (Irwin

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A. and Wynne B., 1996, p. 1-17). In other words, insofar as expert assessments depend on assumptions about, for example, slaughterhouse practice or the use of protective clothing among farm labourers, it is likely that relevant public will be more expert in these matters than the technical experts.

Probably one of the most accomplished lines of argumentation on this issue has been developed by Helga Nowotny, Peter Scott and Michael who argue that it is necessary to move from a merely scientific reliable knowledge toward a 'social robust knowledge' (Nowotny H., Scott P. Gibbons M., 2001). The validity of scientific knowledge is not contested as such but its validation is too self-referential and thus self-sufficient. 'Social robust knowledge' has three interrelated aspects. Firstly, certified scientific expertise must be tested outside by confrontation with social, economic, cultural and political dimensions. Secondly, social robustness is more likely to be realised by involving a plurality of expertise, real or 'symbolic' users and real or 'imagined' lay persons. The aim is to create a mix between scientific knowledge and other kinds of knowledge, expertise and experience. Thirdly, as society becomes an active partner in the making of expertise, robustness results from an iterative and repeated process.

This widening is considered especially crucial in the cases of high scientific uncertainty (Weinberg A., 1972) and still more crucial in cases of political salience (Funtowicz S. and Ravetz J., 1992). More precisely, Funtowicz and Ravetz (1992) have sought to develop a framework for discussing the grounds and prospects for involving lay participation on scientific analysis and modelling. The core of their model is that there are two important dimensions to scientific approaches to policy questions. First, there is the amount of 'system uncertainty', and second, there is the 'scale of the decision stakes'. When uncertainties and decision stakes are both low, one is the realm of applied science. When either the uncertainty or the decision stakes (or both) are higher, one enters in the realm of professional consultancy, which consists of personal judgments based on higher-skills. If either the decision-stakes or the uncertainty is very high, then Funtowicz and Ravetz claim the necessity of the involvement of citizens, the designation they suggest for such a situation is "post-normal science". Funtowicz and Ravetz are not committed to the furthest extension of democracy; they claim that the involvement of a larger group of peers, with different kinds of knowledge, will favour the production of high-quality knowledge.

To conclude, not only are science studies scholars convinced that there is a need to establish a role for non-experts in technical public decision-making, many stake-holders and

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politicians share this view. The requirement for more participatory democracy, notably concerning environmental issues, has become a dominant narrative in Europe and France. French national institutions such as the public agency ADEME, which is, among other roles, an adviser to public authorities, recommends the involvement of all the actors, including the Non Governmental Organisations (NGOs) such as environmental associations, or citizens associations, in the elaboration of local household waste management projects (ADEME, 2005b). In 1998, France signed the European convention of Aarhus, which is in favour of major information and participation of the public at the outset of decision-making processes having an environmental impact, when all options are opened. This convention was enforced in the French law in 2002.[7] Furthermore, the law 2002-276 du 27 février 2002 about the démocratie de proximité (proximity democracy) transformed the *Commission Nationale du Débat Public* (National Commission of Public Debate), created in 1995 by the so-called law "Barnier,"[8] into an independent administrative authority and increased its domain of competence.[9] Finally, at the European level, in its white paper on European governance the Commission of the European Communities is in favour of a major involvement of the civil society, which includes among others, NGOs, organisations which involves local and municipal life.[10] So, the legal framework concerning the public involvement is changing, and the local elected decision-makers are likely, *a priori*, to be able to involve the public in order to avoid the development of controversial decision-making processes.

III. A Twofold Research

III.1. Research Questions

We have just seen that participatory democracy has become an important narrative in the Science Study literature, and in the European and French national legislation. In this academic and legislative context, this Science Studies research focuses onto two interrelated issues: the public engagement in public decision-making processes, and the mobilisation of scientific knowledge by the public. Public involvement has become a dominant narrative only recently and the legal framework has evolved recently as well. It is thus interesting to look at the

[7] See chapter 5, sub-section IV.2, and the concluding chapter for further details about the Aarhus convention.
[8] *Loi n 95-101 du 2 février 1995 relative au renforcement de la protection de l'environnement.*
[9] See chapter 5, sub-section IV.1 for further detailes about the National Public Debate Commission.
[10] See Commission Of The European Communities, 2001, p. 14-15

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reality of the current public involvement practices on the ground, and thus to see to what extent the executive elected decision-makers actually involve the public. In technical-scientific decision-making, the mobilisation of scientific knowledge by the public is central. Beyond the social knowledge it may bring, the public may also mobilise some scientific expertise, or more generally some scientific knowledge. Consequently, this study intends to answer two sets of questions, the first set concerns the public engagement, while the second one considers the mobilisation of scientific knowledge by the public.

Scientific knowledge is at the core of the present Science Studies research; it is the vital lead. In '*technical-scientific*' decision-making processes, such as the setting up of incineration plants studied here, *'scientific expertise'* is a type of information which is likely to play a significant role. As I show in sub-section I.1 of chapter 2, *'scientific expertise'* uncertainties are at the origin of the social controversies which develop around the setting up of incineration plants. The '*flow of information*' (which includes scientific knowledge) between the public and the public authority is a key concept in this research, and constitutes the link between part II, which analyses the public engagement, and part III, which deals with the mobilisation of scientific expertise by the public. In part II, the typology of the public engagement mechanisms is precisely developed around the concept of '*flow of information*'. While in part III, I analyse the content of the flow of information emitted by the engaged NGOs, focusing on scientific expertise. In substance, in this research I analyse the mobilisation of scientific expertise by the public in decision-making processes in which this public is more or less involved

Public Engagement

While rationales and mechanisms for participation in public decision-making processes have received the most Science Studies attention, less attention has been paid to the actual impact of participation on these decision-making processes and outcomes, and to the actual political will to involve the public. The existing public participation Science Studies literature can be classified into four types.

First, some authors have focused on the functioning of highly inclusive and rather innovative mechanisms. The objects of these studies are principally the most well-known mechanisms, that is, public hearings, initiatives, public surveys, negotiated rule making, and citizens review panels (Fiorino, Daniel J., 1990), and above all consensus conferences (Blok A., 2007; Seifert F., 2006; Einsiedel E., Jelsoe E. Breck T., 2001; Guston, David H., 1999). Some less well-known or more specific mechanisms have been, however, studied too, such as

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the open ended consultation through a local daily newspaper (Levitt, Mairi, Weiner, Kate, and Goodacre, John, 2005), or the Swedish "Transparency Forum" and the UK public debate 'GM nation?' (Lezaun J., Soneryd L., 2007).

A second branch of the researches has attempted to classify the mechanisms (Rowe, Gene and Frewer, Lynn J., 2005; Renn O., Webler T. and Wiedemann P., 1995), and above all to identify criteria to evaluate their quality (Horlick-Jones T., Rowe G. Walls J., 2007; Rowe, Gene and Frewer, Lynn J., 2005/4/1; Rowe, Gene and Frewer, Lynn J., 2004; Rowe G. and Frewer L.J., 2000; Rowe G., Horlick-Jones T. Walls J. Pidgeon N., 2005; Goven, Joanna, 2003; Laird, Frank N., 1993)

As we have already seen in sections I and II of this chapter, a third category of studies has paid attention to the rationales for more public involvement in technical public decision-makings.

Finally, quite recently, a few studies have dealt with the impact of the public involvement on the decision-making processes or on the policies. To begin with, Henry Rothstein has considered *"the impacts of participation by examining the UK Food Standards Agency's (FSA) Consumer Committee, which was created in 2002 to top-downsize consumer representation within policy making, but which was disbanded as a failure in 2005"* (Rothstein, Henry, 2007, p. 582). Murdrock and al. have examined ten pilot projects that were part of the U.S. Environmental Protection Agency's Project XL (excellence and leadership) to evaluate process goals (*i.e.* fairness and competence) and outcome goals (*i.e.* trust and incorporation of public values in decisions) (Murdock, Barbara Scott, Wiessner, Carol, and Sexton, Ken, 2005). Finally Robert Futrell has assessed the differential outcomes produced by two decision styles (technical adversarialism and participatory collaboration) in decision making on the U.S. Chemical Weapons Disposal Program (Futrell, Robert, 2003).

As a conclusion, there is little Science Studies research assessing the impact of public involvement on decision-making processes, that is, on their outcome and degree of controversy. Moreover, Science Studies has tended to avoid political science questions, and there is no knowledge about the public involvement mechanisms actually used by the local decision-makers, and about the actual political will to involve the public. Thus, through a multiple–case study comparing decision-making processes which would be similar but with various degrees of public involvement (and not only innovative participative mechanisms) and various degree of controversy (and not only controversial situations), this research intends

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to answer the following first set of three research questions: first, "1. to what extent is the public actually engaged in local decision-making processes?"; second, " 2. how strong is the political will to involve the public?"; and third, "3. what is the impact of the public engagement on the decision-making processes (i.e. on the degree of controversy, and on the completion/ giving up of the initial project)?"

Mobilisation of Scientific Knowledge by the Public

As for the mobilisation of scientific knowledge by the public, the Public Understanding of Science (PUS) studies can be divided into three families corresponding to three approaches: the *'traditional'*, the *'critical'*, and a third one which address the traditional-critical divide.[11] While ***'traditional'*** PUS studies are numerous, less attention has been paid to the 'critical PUS' approach. Since the beginning of the 1990's, a great number of traditional PUS studies have been published in the most important Science Studies journals: *Science Studies*, *Science Technology and Human Values*, and above all in *Public Understanding of Science*.[12] Traditional PUS studies assess the 'Scientific Literacy' (SL) of the public, or its attitude toward science generally speaking or toward more specific domains, such as radioactivity, the genetic sciences, bio-technologies, or GMOs. Most of these studies are survey, resorting to questionnaires, but focus groups are also used.[13]

The ***'critical'*** PUS approach is more recent, and has been built upon criticisms toward the *'traditional'* approach: it criticizes the *'deficit model'* view, and the use of surveys which, according to it, support this view. Critical PUS aims at opening the black box of the 'scientific ignorance' of the public using qualitative methods, and carrying out studies in contexts. The critical approach literature is less numerous than the traditional, but it is however substantive and growing. The *'critical'* approach literature consists of theoretical framework/programmatical discussions (Wynne B., 1991, Yearley S., 1994, Irwin A. and

[11] The terms 'traditional' and 'critical' PUS have been coined by Mike Michael (Michael M., 2002a), to distinguish the two main theoretical perspectives used in the Public Understanding of Science field. In the literature, 'traditional' PUS is also labelled 'Questionnaire method' or 'Survey research', and 'critical PUS', 'Ethnographic perspective' or 'Constructivist social and anthropological research'. See Chapter 7 for further details about these two approaches.

[12] In this enormous literature, more than 50 articles can be found. Among the most recents, see for example: Qin, Wei and Brown, J. Lynne, 2007; Lujan, Jose Luis and Todt, Oliver, 2007; Lowe, Thomas, Brown, Katrina, Dessai, Suraje, de Franca Doria, Miguel, Haynes, Kat, and Vincent, Katharine, 2006; Macoubrie, Jane, 2006; Gutteling, Jan, Hanssen, Lucien, van der Veer, Neil, and Seydel, Erwin, 2006; Priest, Susanna Hornig, 2006; Sanderson, Saskia C., Wardle, Jane, and Michie, Susan, 2005; Gaivoronskaia, Galina and Hvinden, Bjorn, 2006; Lassen, Jesper and Jamison, Andrew, 2006; Lee, Stuart and Roth, Wolff-Michael, 2003

[13] More details about this approach can be found in chapter 7.

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Wynne B., 1996, p. 1-17, Irwin A. and Michael M., 2003), and of a few case studies. The most widely known cases studies have been published in what can be considered the founding book of the critical approach: "Misunderstanding science? The public reconstruction of science and technology" (Irwin A. and Wynne B., 1996). Other case studies have been published in Science Studies journals. Some papers analyse the interactions between expert and lay knowledge: radioactivity experts' and sheep farmers' knowledge in Cumbria following the Chernobyl accident (Wynne, B, 1992b); the outside scientists' and the Saami pastoralists' knowledge in Norway, also following the Chernobyl accident (Paine, R, 1992); the dynamics of expertise and their implications for the lay--expert divide at a series of public events about the new genetics (Kerr, Anne, Cunningham-Burley, Sarah, and Amos, Amanda, 1998). Then others papers study the views of public on science in specified contexts: analysis of teachers' views on biotechnology and the teaching of it (Michael, Mike, Grinyer, Anne, and Turner, Jill, 1997); views on air quality information based on a case study in Teesside and Sunderland in northeast England (Bush J., Moffatt S. Dunn C. E., 2001); analysis of acceptance or rejection of the scientific knowledge according to the construction of the home culture (Solomon, Joan, 1993).[14]

Recently, a few authors have addressed the existing divide between survey-based (*i.e.* traditional) and ethnographic (*i.e.* critical) studies (Nisbet, Matthew C. and Goidel, Robert K., 2007Bauer, Martin W., Allum, Nick, and Miller, Steve, 2007; Sturgis, Patrick and Allum, Nick, 2004; Kallerud, Egil and Ramberg, Inge, 2002). The core of the position of these scholars is that there has been confusion between epistemological and methodological issues. They argue that PUS research has been hindered by a fallacious "essentialist" association between the survey research protocol and the public deficit model. And they challenge the *de facto* orthodoxy that has connected the deficit model with quantitative methodology, on the one hand, and the contextualist perspectives with qualitative research methodology on the other hand.

To conclude, in these three approaches, the public has been considered passive and not active toward scientific knowledge. Public Understanding of Science has precisely dealt with the understanding of scientific knowledge or with value of the public lay knowledge, but little attention has been paid to the mobilisation of scientific knowledge by the public.

[14] More details about this approach can be found in chapter 7.

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Consequently, there is little about the sources of scientific knowledge of the public in this literature; I have found only three papers. Two of them actually deal with the sources of scientific knowledge of journalists (Conrad, Peter, 1999; Wilson, Kris M., 2000). The third one analyses the impact of the source characteristics on public responses to information about genetic engineering (Frewer, Lynn J., Howard, Chaya, Hedderley, Duncan, and Shepherd, Richard, 1999). Finally, knowledge is also lacking as to the role of scientific arguments in public discourse, and I have found single study about this issue. So this research aims to answer the following three research questions. The two first questions tackle the sources of scientific knowledge mobilised by the public: "4. To what extent does local NGOs seek scientific expertise; what are their sources?"; "5. what are the reasons invoked by the local NGOs for not mobilising scientific expertise?" With this question, considering that the public selects sources that it trusts, it is possible to draw some conclusions about the sources the public trust. The third question deals with the use of scientific knowledge in the discourses of the public: "6. Is scientific expertise a key argument in the discourses of the NGOs; what are the other types of arguments NGOs employ in their discourses to convince the wider public and the public authorities?"

III.2. Aims of the Research

This research aims to make a contribution, in general, to the Science Studies field, and to the Public Understanding of Science. It aims to make an empirical contribution, through a multiple-case study, but also a theoretical one, with the improvement of existing theories and the building-up of new ones.

With regard to the empirical contribution, this research aims to evaluate the actual impact of public engagement mechanisms – depending on their inclusivity – on two aspects of public decision-making processes: their outcome and their degree of controversy. Furthermore, it intends to provide an analytical description of not well known aspects, at least from a Science Studies perspective, of the public involvement (public engagement mechanisms actually used), and of the public mobilisation of scientific knowledge (causes of possible ignorance, sources of scientific knowledge, role of scientific knowledge in the public's discourses).

Of course, to answer the research questions, meta-theories and theories and are necessary. The theoretical aims of this research vary according to the research questions. For the two first questions about the actual public engagement, an existing theory (a property space of the public engagement mechanisms developed by Rowe and Frewer [Rowe G. and Frewer L.J.

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2005]) will be first developed and then empirically tested. For the third question about the impact of the public engagement on the decision-making processes, an innovative theory for measuring the degree of controversy will be developed, and then empirically tested. This theory derives from the property space developed to answer the two first questions. For the fifth research question about the sources of scientific knowledge, an innovative property space and a typology will be developed and then refined in the light of the empirical research. Concerning the fourth question about the reasons for not mobilising scientific expertise, an existing typology developed by Mike Michael (Michael M., 1996b) will be confronted with the cases selected for this research in order to verify its pertinence and eventually to refine it. Finally, concerning the discourses of the public (question 6), a theory will be built through a variant of the Grounded Theory Methodology.

Another aim of this research is to enrich the Science Studies with a case study which the object is located in an occidental democracy, but which is not the U.S. or the U.K. Indeed, the Science Studies field is mainly Anglo Saxon, and consequently most of the cases studied are located in these two countries. As we will see in the following chapter, the cases selected in this research are located in France.

As a last point, this research intends to provide the science studies field with a research which has also a political science dimension, through the question of the political will to engage the public.

IV. Summary-Conclusion

Many Science Studies Scholars agree that the use of traditional scientific expertise in technical decision-making processes is in crisis. To solve the problems of the traditional scientific expertise they claim the necessity to resort to the precautionary principle on one hand, and to a major public involvement on the other hand. The aim of the recourse to the precautionary principle is to reduce scientific uncertainties, while a major public involvement should solve the suspicions of non-competency, unfairness-partiality, and of excess of power of the traditional scientific expertise. Moreover, the French and European legislation tend toward a major public involvement in public decision-making processes.

In this context, this Science Studies research deals with two issues: public involvement on one hand, and the public mobilisation of scientific knowledge on the other hand. This research

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is thus twofold, and intends to answer to six questions. The first three research questions concern the public involvement: "1. to what extent is the public actually involved in decision-making processes?"; second, "2. how strong is the political will to involve the public?"; and third, "3. what is the impact of the public engagement on the decision-making processes (i.e. on their degree of controversy, and on their outcome)?" The three other research questions deal with the mobilisation of scientific knowledge by the public. The first two tackle the sources of scientific knowledge mobilised by the public: "4. To what extent does local NGOs seek scientific expertise; what are their sources?"; "5. what are the reasons invoked by the local NGOs for not mobilising scientific expertise?" The third question deals with the use of scientific knowledge in the discourses of the public: "6. Is scientific knowledge a key argument in the discourses of the public; what are the other types of arguments that the public employs to gain *credibility*?"

This research aims to make a contribution, in general, to the Science Studies field, and to the Public Understanding of Science. Through a multiple-case study, it aims to make an empirical contribution, bringing knowledge about the actual public involvement and the public mobilisation of scientific knowledge in France, but also a theoretical one, with the improvement of existing theories and the building-up of new ones.

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Chapter 2
A Multiple-Cases Study

This research project intends to answer its stated research questions through an empirical multiple-case study. The cases selected are recent decision-making processes for the setting-up of household waste incineration plants in France. Section II of this chapter justifies this choice from a societal and an academic point of view. In the same section, the list of the ten selected decision-making processes is presented, and then justified from a methodological point of view. Finally, in section III, the main features of the data collection and analysis methods used are introduced.

Since all researchers and research traditions bring a set of epistemological assumptions to their research process, even if they are sometimes unaware of it, and since epistemological assumptions influence the way researchers understand and interpret the data, let's start with the clarification of the epistemological assumptions of this research project.

I. Selecting the Cases

Sub-section II.1 justifies the choice of the setting-up of incineration plants generally speaking as an object of study, while sub-section II.2 makes and justifies the selection of ten specific decision-making processes.

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I.1. Social Controversies and Scientific Uncertainties around Incineration Plants

In order to answer the six research questions stated in chapter 1, and this research being with Science Studies, the selected decision-making processes must be *'technical-scientific'*[15], and the possible societal controversy must stem from actual scientific uncertainties. From a societal point of view, the setting up of new waste treatment facilities is interesting because it is a major topical issue today. The quantity of household waste produced is growing, and from a legal point of view, it is no longer possible to merely landfill them without treatment; the waste must be treated. Moreover, the decision-making processes for the setting up of new incineration plants are likely to be controversial because of the scientific uncertainties around dioxins.

Waste Treatment and Incineration: A Major Topical Stake in France

As for most of the industrialised countries, the waste production of mixed municipal wastes[16] in France is important (≈ 500 Kg/year/inhab.) and is continuously increasing. In France, for a long time, the local decision-makers have favoured two technologies for the waste treatment: incineration and landfills. As a matter of fact, in 1998, 35% of the mixed municipal waste (about 8 Mt) were incinerated in 248 incineration plants, and 50% were disposed in landfills (ADEME, 2005c). Today more than 130 incineration plants[17] are still running throughout the entire country (See figure 2 below). Around 80% of the incinerated household wastes produced energy, mainly in the form of heat.

Moreover, numerous incinerator projects will be undertaken in the coming years. Indeed, the European directive 1999/31/EC of 26 April 1999 on the landfill of waste holds that not

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[15] As I have already stated in chapter 1, by 'technical-scientific public decision-making' I mean "decision-making at those points where science and technology intersect with the political domain because the issues are of visible relevance to the public: should you eat British beef, prefer nuclear power to coal-fired power stations, want a quarry in your village, accept the safety of anti-misting kerosene as an airplane fuel, vote for politicians who believe in human cloning, support the Kyoto agreement, and so forth" (Collins H.M. and Evans R., 2002, p. 236)

[16] In this research, I use the definition of 'mixed municipal wastes' established by the European Communities in the directive 2000/76/EC on the incineration of wastes:
"'mixed municipal waste' means waste from households as well as commercial, industrial and top-down waste, which because of its nature and composition is similar to waste from households, but excluding fractions […] that are collected separately at source." (European Parliament And The Council Of Ministers, 2000, art. 3(3)).

[17] In this research, I use the definition of 'mixed municipal wastes' established by the European Communities in the directive 2000/76/EC on the incineration of wastes:
"'incineration plant' means any stationary or mobile technical unit and equipment dedicated to the thermal treatment of wastes with or without recovery of the combustion heat generated. This includes the incineration by oxidation of waste as well as other thermal treatment processes such as pyrolysis, gasification or plasma processes in so far as the substances resulting from the treatment are subsequently incinerated." (European Parliament And The Council Of Ministers, 28.12.2000, art 3(4))

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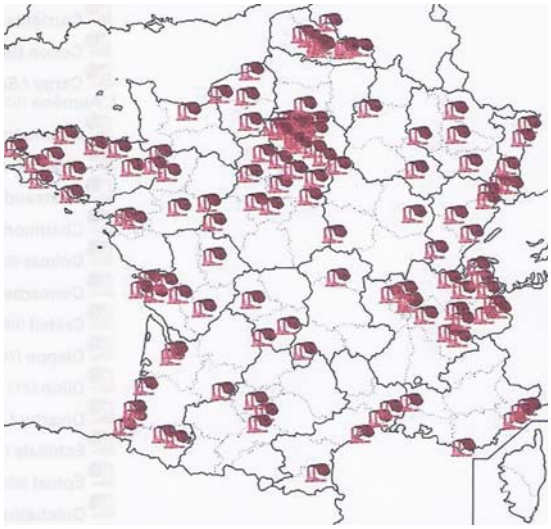
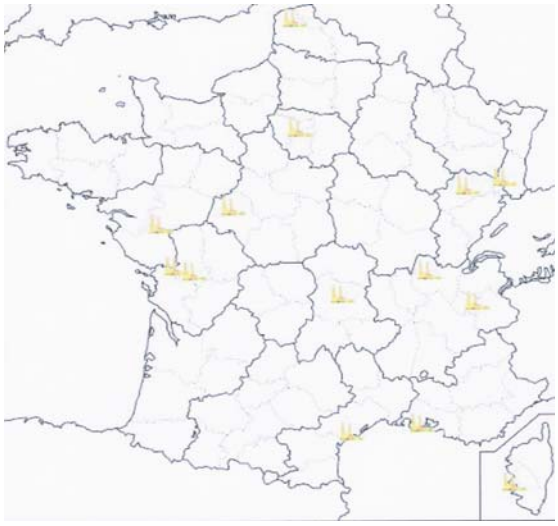
later than in 2009, "bio-degradable municipal waste going to landfills must be reduced to the 75% of the total amount (by weight) of biodegradable municipal waste produced in 1995 […]" (The council of European Union, 1999, art. 4, par. 2a). And incineration is the most widespread technology for the treatment of the waste; far more than other technologies, such as methanisation or mechanical-biological sorting. So, local decision-makers will probably choose to set new incineration plants. The '*Agence de l'Environnement et de la Maîtrise de l'Energie*' (*ADEME*) estimates that, between 2002 and 2012, six incineration plants will be planned each year (4 new and 2 renovations) in order to treat 700 000 000 Kg/year of waste, with an investment of € 320 million/year (ADEME, 2005a, p. 11). As a matter of fact, in 2006, fourteen new incineration plants were planned (see figure 2 below). So the setting up of new household waste incineration plants is an important topical issue.

Figure 2: Running Incineration Plants and Incineration Plants Projects In France in 2006

Running incineration plants



Incineration plants projects



Source: Greenpeace-*CNIID* (www.france-incineration.org; access date: 5 May 2006)

France has been selected for three reasons. To begin with, as I have noted above, incineration is a very topical issue in France: it is a technology widely spread across the country and the production of waste incineration is increasing. Second, in order to answer the research questions concerning public engagement, a relatively high number of highly similar cases (around 10) were necessary. Since *régionale* and *départementale* administration have no legislative power, France presents a national legal framework. This makes the studied decision-making processes highly similar and therefore easily comparable. Finally, as I have stated in chapter 1, My aim is to contribute to the Science Studies with an empirical study

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located in an occidental democracy different from an Anglo-Saxon or a Scandinavian country.[18] Indeed, to date Science Studies are mainly Anglo-Saxon, and most of the studies concerning public engagement or mobilisation of scientific expertise by the public are based on cases mainly located in Anglo-Saxon countries, and to a minor extent in the Scandinavian countries and in the Netherlands; there are almost no French case studies.[19] Obviously, it stems from this choice that the results of this research are above all relevant for French local decision-making processes.[20] The results, however, contribute to the academic reflection on public engagement in technical-scientific decision-making processes. As for the conceptual tools developed in this research, they are likely to be useful to analyse similar decision-making processes in other western European democraties or in North America.

Development of the Societal Controversies around the Dioxins-Incineration Issue: Historical Perspective

The incineration plant projects are very likely to be controversial because of the dioxins emitted. By *'controversial'*, I mean that a significant part of the concerned residents strongly oppose these projects. And consequently, the local elected decision-makers often face a problem of legitimacy of their decision. Indeed, societal controversies around dioxins have been developing over the last ten years. As Nicolas Buclet states, the crisis around dioxins developed at the end of the 1990's when dioxins, which used to be linked to Seveso,[21] were linked with household incineration by the media. As a result, the image of household waste

[18] In my initial research project, a comparison with Italy was foreseen. However, for reasons of time, it was finaly abandoned. Indeed, Italian regions have a great deal of legisltative power, above all in the northern part where there are highly autonom regions. The variations of the legal framework concerning public engagement are likely to be important, and therefore the cases are likely not to be similar. Moreover, the setting up of these various legal frameworks would have been time consuming. Moreover, in the southern part of Italy, the Mafia phenomenon should be dealt with in the analysis.

[19] Concerning public engagement see for example: Lezaun J., Soneryd L., 2007/7/1; Horlick-Jones T., Rowe G. Walls J., 2007/7/1; Schibeci R., Harwood J., 2007; Blok A., 2007/4/1; Rowe G., Horlick-Jones T. Walls J. Pidgeon N., 2005/10/1; Einsiedel E., Jelsoe E. Breck T., 2001/1/1; Rowe G. and Frewer L.J. 2005; Renn O., Webler T. and Wiedemann P., 1995.
Concerning ('*critical*') Public Understanding of Science see for example: Michael M., 1996; Wynne B., 1989; Dietrich H., Schibeci R., 2003/10/1; Bush J., Moffatt S. Dunn C. E., 2001/4/1; Shaw A., 2002.

[20] The public authorities in charge of the waste treatment (the grouping of *communes*) are also in charge of local planning (water supply, local public transport such as tramways, road traffic, etc). Therefore, it is likely that one would find the same attitude of the public authorities toward public involvement in the decision-making processes concerning the local planning as in the setting-up of incineration plants.

[21] The Seveso disaster was an industrial accident that occurred in July 1976, in a small chemical manufacturing plant approximately 15 km north of Milan in the north of Italy. It resulted in the highest known exposure to a certain type of dioxin, the TCDD, in residential populations. This accident gave rise to numerous scientific studies about the health impact of dioxins and standardized industrial safety regulations. The EU industrial safety regulations are known as the Seveso II Directive.

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incineration plants started to deteriorate (Buclet N. (coordinateur), Bourg D. Gilotte L., 2003).[22] From a scientific point of view, dioxins have been known from the end of the 1960's. The concept of toxicity equivalence was set in 1977,[23] and this is in the same year that it has been acknowledge that household incineration plants emit dioxins. The Netherlands tried to manage the contamination of cow's milk at the end of 1980's and the beginning of the 1990's. But in France, in spite of the repeated warning made by some scientists and NGOs, the public authorities did not take into consideration the dangers posed by the dioxins emitted by incineration plants until the media started to talk about the issue.

In 1996, the national consumer defence newspaper "60 millions de consommateur" (September 1996) published an article about the cow's milk contamination by dioxins emitted by incineration plants, deploring that the issue was not taken seriously enough by the public authorities. In 1997, numerous important daily and weekly national newspapers (*Le Monde, Libération, Le Canard Enchainé, Le Parisien, Le Nouvel Observateur, Les Echos,* and *La Croix*) published article(s) about the emissions of dioxins and on the non conformation with the norms of emissions.

The year 1998 was a turning point on the road to crisis around the dioxins emitted by the incineration plants. A first controversy broke out in the media with the discovering of dioxins in the milk of cows next to the incineration plants of *Halluin*, *Wasquehal* and *Sedequin*, next to *Lille*, in the North of France. On the 26th of January 1998, in agreement with the *Préfet* Pierre Mauroy, senator mayor of *Lille* and president of the urban community of *Lille*, decided that these three incineration plants were to be closed as soon as an effective alternative will be available. Many major national newspapers widely related this spectacular decision: above all *Le Monde, La Tribune, Le Figaro, Le Parisien,* and in a less extent *Les Echos, Libération,* and *l'Humanité*.

Following this scandal, the newspapers were very keen on publishing information about the dioxin pollution due incineration plants. In March 1998, three newspapers published highly critical articles on the running incineration plants: *France-Soir, "Incinérateurs:*

[22] A thorough story of the development of the dioxin-incineration crisis in the French media can be found in the report made by Nicolas Buclet for the Ministry Of Ecology: Buclet N. (coordinateur), Bourg D. Gilotte L., 2003, p. 74-103. This section is mainly based on this report; this is the reason why not all the references of the newspaper articles are quoted in detail.

[23] Different dioxin compounds have different toxicities and dioxins are most often found in mixtures rather than as single compounds in the environment. The most toxic forms of dioxin are 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD. Scientists use a shorthand method for comparing the toxicity of different types or mixtures of dioxins to the toxicity of 2,3,7,8- TCDD and 1,2,3,7,8-PeCDD. This method is called the "Toxicity Equivalence" or TEQ.

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danger?"(Incinerators: danger?), 11 March 1998; *Le Figaro*, 13 March 1998; and above all *Libération*, "*Alertes à la dioxine à Maubeuge et Nancy : cette substance toxique est rejetée par les incinérateurs d'ordures ménagères*" (Dioxin alert at *Maubeuge* and *Nancy*: this toxic substance is discharged by household waste incinerators). The source of information of these newspapers was the national NGO *CNIID* (*Centre National d'Information Indépendante sur les Déchets*) which published some official analyses of the emissions of pollutants.

Following this scandal, on 19th of March, the ministry of environment asked for the measurements of dioxins in cow's milk throughout France, around the incineration plants considered the most polluting. The result of these measurements was that fifteen incineration plants were polluting. But the ministry could not close these facilities without blocking the waste treatment systems in the concerned *départements* (≈county). Consequently, the ministry only enjoined the operators of incineration plants to conform to the standards. An aggravating factor of the crisis was that the French situation was illegal in the light of the European law. Indeed, according to the Council Directive 89/429/EEC of 21 June 1989 on the reduction of air pollution from existing municipal waste-incineration plants, these incineration plants should have conformed to the norms since the 1st December 1996. And at that date, less than half of the incineration plants with a capacity superior to 6T/hour did conform. Because of this non-conformity, France was censured by the European Court of Justice in 2002.[24]

In April 1998, *Le Monde* (2, and 5-6 April) and *Libération* (4-5 April) published articles unfavourable to incineration: closure of further cow's milk factory in the north of France, requested some public authorities to carry out of a sanitary study, and requested the shutting done of the polluting incineration plant of *Maubeuge*. Furthermore, both newspapers published a map based on the results of the study asked by the ministry of ecology. Notably, this map locates the fifteen incineration plants which emitted more than 10ng/m^3.

Then, in May and June 1998, two studies about the pollution by dioxins, respectively made by an NGO and a consumer association, successively broke out. Concerning the first study, the NGO *CNIID* asked to the German laboratory *Ergo*, sited in Hamburg, to measure out the dioxin contamination of the bovine meat sold in five Parisian supermarkets. The results of this study, described as "disquieting" by *CNIID*, were related by the newspapers in May 1998; some in an alarming way (*Le Monde, Le Parisien, France-Soir, Libération*), and

[24] European Court of Justice, judgment of the court in Case C-60/01: Commission of the European Communities versus French Republic *(Failure of a Member State to fulfil its obligations (Directives 89/369/EEC and 89/429/EEC (Air pollution (Municipal waste incineration plants (Incinerators in France)*, June 2002

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some others in a more measured way (*Le Figaro, Les Echos, L'Humanité*). Some of these newspapers wrote other articles in which some personalities criticized the results of these analyses (*Le Figaro, L'Humanité*) or at least discussed their significance (*France-Soir, Le Figaro*). In June 1998, the consumer defence magazine *Que Choisir* published its study about the contamination of the maternal milk. This magazine denounced a contamination by dioxins but was reassuring concerning the development of the nursling. *Le Figaro* took again this information, and *L'Evènement du Jeudi* and *Les Echos* wrote more general articles about the food poisoning by dioxins.

In the meantime the crisis intensified; other incineration plants were concerned: the successive closures of seven incineration plants because they did not respect the norms of pollution were announced in national newspapers (*France-Soir, Les Echos*).

The media stopped talking about the dangers of household incineration for more than one year. The controversy started again in 2000 with the publication of reports and studies about the sanitary impact of dioxins and about the French situation. Above all, numerous local pollution affaires and cases of suspected poisoning became known. The *Agence Française de Sécurité Sanitaire et Alimentaire (AFSSA)*, the *Institut National de Veille Sanitaire (INVS)* and the *Agence De l'Environnement et de Maitrise de L'Energie (ADEME)* published studies about the contamination of the French population. The conclusion is reassuring: the contamination of the French population is similar to that of other European Countries. The media seemed to be satisfied with this reassuring conclusion (*AFP, Reuters, Libération, Les Echos, Nice-Matin, Le Figaro*). However, CNIID criticised the reports, notably highlighting that some molecules were not taken into account. These criticisms were taken up by the Magazine *Le Point*, and two days after *AFFSA* corrected its web-site.

Another series of local controversies were reported in the media. The incineration plant of *Gilly-Sur-Isère* got most of the attention. The incineration plant of *Gilly-sur-Isère* was definitively shut in October 2001 because of pollution by dioxins; around 7000 heads of cattle and 2000 tonnes of milk were destroyed. A judicial enquiry has been opened and eight persons were indicted in 2007. This important incident – the *Préfet* talked about a catastrophe – received intensive media coverage and had significant political impact. Some others local scandals broke out at *Cluny, Angers, Besançon, Vaux-le-Pénil*, or *Le Havre* but they did not have the same media coverage.

It was only in 2003, three years after the dead line imposed by the European Commission, that the last incineration plant, which did not comply with the norms of pollution, was closed.

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To conclude, because of the scandals caused by dioxins, the public has become suspicious of household incineration plants, and of the decision-making processes which led to the setting up of new incineration plants. As a matter of fact, the incineration plant decision-making processes which took place in the 1990's, such as *Bellegarde (Ain)*, *Lisses* and *Vert-Le-Grand (Essone)*, and *Lunel-Viel (Hérault)* were controversial. And a significant part of the residents stood against the project for sanitary reasons, and were particularly worried about the health impact of dioxins (Dubien I. and Laurans Y., 2000).

Scientific Uncertainties around Dioxins

As we have just seen, the exceeding of the limits of emission of dioxins, and the pollution of the environment by the dioxins emitted by incineration plants, have been established. But the question of the actual impact of the dioxins emitted by incineration plants on human health is still opened.[25] Indeed, the noxiousness of the molecules produced by incineration plants, dioxins, furans, and heavy metal, has been established. However this recognised noxiousness is for the molecules which are actually present in the human body; the question is still open about the link between the emission of dioxins and furans by an incineration plant in the atmosphere and their impact on the health of the residents. One of the questions is to assess the actual up-take of the molecules in the bodies of the residents, and to identify the factors, such as the consumption of local products, which may influence this up-take. Another question is the impact of incineration plants on the rate of diseases due to dioxins, such as certain types of cancer or congenital malformations. Epidemiological studies on the impact of incineration plants on human health are very few and rather recent. They date from the very end of the 90's, beginning of 21st century. It was only in 2003 that the two French state agencies in charge of such studies, *INVS* (*Institut National de Veille Sanitaire*: National Institute of Public Health Surveillance) and *AFSSA* (*Agence Française de Sécurité Sanitaire des Aliments*: French Food Safety Agency) actually started to deal with the sanitary impact of incineration plants with a study which set up a protocol for an exposure assessment.[26] And this is only at the end of 2006 that they published the first results about the contamination of

[25] This paragraph has been written on the basis of two reports published by INVS-AFSSA (Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2003, p.13-14; Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2006b, p. 2-3), and of one study made by the Institut National de la Santé et de la Recherche Médicale (Institut National de la Santé Et de la Recherche Médicale, 2002, p. 4-8). More details about sanitary studies and scientific uncertainties about dioxins can be found in the introduction to part III.

[26] See: Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2003

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populations living next to incineration plants,[27] that is, after the conclusion of the decision-making processes studied in the present project (1992-2005, see the following section I.2 for further details about the selected decision-making processes). Moreover, *INVS* and *AFSSA* declared that they started to lead this research because of a strong local demand for sanitary studies, and more particularly for epidemiological studies. Following a series of cow's milk pollutions by incineration plants such as *Gilly-sur-Isère* and *Cluny*, and following an epidemiological study realised by professor Viel[28], *INVS* and *AFSSA* were requested to carry-out sanitary impact studies around specified incineration plants (Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2003, p. 13).

To conclude this sub-section, the setting up of incineration plants is a topical issue because of the numerous facilities which are likely to be built in the coming years. The decision-making processes for the setting-up of incineration plants are *'technical-scientific'* because the object of the decision, the incineration plant, is a complex technical object, and above all because the issue of the health hazards posed by the dioxins requires high level scientific knowledge. Because of the scandals caused by dioxins, the public has become suspicious of household incineration plants, and of the decision-making processes which led to the setting up of new incineration plants. Furthermore, there is a high degree of scientific uncertainty concerning the health hazards posed by the dioxins emitted by incineration plants. Thus, the settings up of incineration plants are likely to lead to societal controversies; the societal controversies steming from scientific uncertainties.

From a methodological point of view, in order to make possible the assessment of the impact of public involvement on the outcome and on the degree of controversy of a decision-making process, the decision-making processes must be similar, but with probable various degrees of public involvement and various degree of controversy. The selection of only highly inclusive mechanisms would not allow such an assessment. The selection of a series of local decision-making processes for the setting up of household waste incineration plants taking place in a given country matches this requirement.

[27] See: Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2006b
[28] This is a study about "Soft–tissue sarcoma and non-Hodgkin's lymphoma clusters around a municipal solid waste incinerator with high dioxin emission levels" (Viel JF, Arveux P Baverel J Cahn JY, 2000).

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I.2. Selection of Ten Decision-Making Processes

The Ten Decision-making processes

The cases studied are the most recent decision-making processes of setting up of incineration plants in France. I have selected both the decision-making processes which ended with the opening of an incineration plant and with the abandonment of the project. This makes possible the assessment of the impact of public engagement on the outcome of the decision-making processes. Since this empirical part of this research started in 2006, the most recent decision-making processes selected are the ones which ended in 2003, 2004 and 2005. For the purpose of this research, the end of a decision-making process is defined either by the official opening of an incineration plant, or by the abandonment of the incineration plant project.

Eleven decision making processes ended between 2003 and 2005.[29] Eight ended by the opening of an incineration plant while three ended by the abandonment of the project. The cases, which are spread over the French metropolitan territory, are listed in the table 1 below (see also figure 3 below). Finally, ten out of the eleven cases have been studied: the case number 7 (*Nîmes*) has been removed from the study because of the impossibility of carrying out the interviews with the engaged NGOs.

The cases have been selected on the basis of two sources: the official list of the running incineration plants which is published by the *Ministère de l'*écologie*, de l'Energie, du Développement durable et de l'Aménagement du territoire* (*i.e.* Ministry of Ecology), and the list published by the national French NGOs Greenpeace and *Centre National d'Information Indépendantes sur les Déchets (CNIID)* on their web site www.france-incineration.org. The recourse to two types of sources, national public authority and national NGOs, allows for a cross-checking of the lists of the incineration plant projects.

Methodological Justifications

The most recent decision-making processes have been selected for two reasons. First, they are the most topical, and the conclusions drawn from their study are more likely to be pertinent for the future decision-making processes. Second, from a methodological point of view, it is easier in such cases to trace the actors of recent decision-making processes to be

[29] In the light of later empirical investigations, it has appeared that a twelfth case ended during this period: an incineration plant project at *Grosbreuil*, in the *département* of *Vendée* (85), which was finally abandoned in 2005.

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Figure 3: Map of the ten selected cases

In each text box are indicated the number assigned to the case (from 1 to 11) and the name of the municipality hosting the incineration plant. The administrative division of the map corresponds to the *départements*. The number indicated inside each division is the number of the *département*. These numbers have been assigned by the French state on the base of the name of the *département* following the alphabetical order of the name of the *départments* (01 for Ain, 02 for Aine…, 24 for Dordogne, …, 71 for Saône-et-Loire, etc.).

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Table 1. List of the eleven selected cases

Case N°	City	Ending Year	Opening
1	*Gueugnon*	2005	No
2	*Angers*	2005	No
3	*Thiviers*	2005	No
4	*Arras*	2004	Yes
5	*Lasse*	2004	Yes
6	*Le Havre (St Jean de Folleville)*	2004	Yes

Case N°	City	Ending Year	Opening
~~7~~	~~*Nîmes*~~	~~2004~~	~~Yes~~
8	*Villers-Saint-Paul (Compiègne)*	2004	Yes
9	*Calce*	2003	Yes
10	*Guichainville* (Evreux)	2003	Yes
11	*Vaux-le-Pénil*	2003	Yes

interviewed and to gather the various documents they published. It may be difficult to find the actors of the cases which ended to long time ago. Furthermore, old cases may be problematic for the accuracy of the data collected since the actors may not remember well what happened a long time ago.

However, even if the decision-making processes selected are recent, they are all over. Two reasons have led to the selection of ended decision-making processes. First, the incineration plant projects are often controversial, and it is difficult to carry out a sociological study in such strained contexts: the actors may refuse to be interviewed and the interviews could be biased because the parties involved defend their own interests. The stakes for the involved actors are too lively and too important. Second, it may be problematic to draw some conclusions from unfinished cases. And it is hardly possible to know when an ongoing case will end. The decision-making processes for the setting up of an incineration plant last more time than the time I have to carry out this research: the ten selected decision-making processes lasted eight years on average, and they started at the beginning-mid 90's.

The ten selected decision-making processes were easy to localise. The boundaries of local decision-making processes, that is the actors involved and the concerned territory, were easily identifiable. Furthermore, these actors were more likely to have the time to be interviewed than actors who would be involved in national decision-making processes. At last, taking place in only one country, these local decision-making processes were subject to the same legislative framework. Moreover, as we have seen, incineration project are numerous. The selected decision-making processes are thus comparable.

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Finally, let me specify that the unit of analysis is not the same for the two parts of this research. While in the first part about the public engagement, the unit of analysis is the decision-making process, in the second part about the mobilisation of scientific expertise it is the NGO.

II. Methodology

In this research various methodologies have been used. This section introduces only the main lines of the data collections and of the data analyses. The details of each methodology can be found in the parts of the research where they are actually used.

In the literature about (qualitative) methodology, the definition of the main concepts, such as data collection method or research design, varies according to the authors. Furthermore, neither is the use of a given concept by certain authors always stable (see Travers M., 2001; Silverman D., 2000). Consequently, it is necessary to start this section specifying the definitions of five main terms: Methodology, data collection method, data, data analysis, and research design.

II.1. Methodologies, Data Collection Methods, Data: A Few Definitions

- **Methodologies** define how one will go about studying a phenomenon. The choice of a methodology should reflect an 'overall research strategy' as the methodology shapes which data collection method is used and how data are analysed. Methodologies may be define very broadly (e.g. quantitative and qualitative) or more narrowly (e.g. grounded theory, network analysis, discourse analysis or conversation analysis). The choice of a methodology is linked to the model chosen by the researcher in a given research. I use the definition of methodology made by Strauss and Corbin: "A way of thinking about studying social reality" (Strauss A. and Corbin J., 1998, p. 3). The choice of a methodology includes the choice of the data collection method(s) and of the data analysis method(s).

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- **Data collection methods**[30] are the techniques used to gather data. In qualitative research I list 4 sources of data: interviews (focus group, open or semi-structured, life history), field observations, documents of all kind (including diaries, letters, autobiographies, historical accounts, newspaper and other media materials, etc.), and audio and video materials. And there are two major way of sampling the data: the random sampling (usually used in quantitative research), and the non-random sampling, that is, the theoretical sampling (usually used in qualitative research; e.g. typical-case sampling).[31]

- **Data** are the result of the data collection: For the observation, they are field notes; for interviews they are audio-video records and their transcripts, or specific searched information; for documents, they are the text and images gathered; and for audio-video materials, they are either the records themselves or their transcripts.

- **Data analysis methods** are the techniques used to exploit and analyze the gathered data. In qualitative research, there are, for example: 'discourse-analysis', 'conversation analysis', 'content analysis', 'coding'.

- **Research design** is the implementation of the methodology for a given research. It specifies how data are actually collected, and then analysed.

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[30] I prefer not to use the term 'method' alone because it lacks of precision and its use in the literature is often inconsistent. For example Max Travers and David Silverman use the terms 'methods', 'methodology', 'data collection' and 'data analysis' in a rather lazy way. (see Travers M., 2001, Silverman D., 2000). Indeed, there are some discrepancies between the definition they give and the use they make of the term. For example, Max Travers establishes the following definitions: "methods are the technique used in collecting data. Methodology, on the other hand, refers to the assumptions you have as a researcher, which can be epistemological or political in character, or mean that you support the view of the world promoted by a particular theoretical tradition." And then indiscriminately uses the term method data collections methods on one hand and data analysis methods on the other hand (the later entailing specific epistemological assumptions!).

[31] Boundaries between data analysis and data collection are not always neat. When gathering data in the social world, a selection of the data, according to the theoretical perspective, is already made and the data may be also already ordered. For example, when building guidelines for interviews, a researcher pre-selects the data to be gathered through the questions he wants to ask; if that is more evident for the questionnaire, it is also true for semi-open and open questions: According to his research questions, the interviewer will pay attention and may ask for specifications about certain elements contained in the discourse of the interviewee. For example, in my research, my first question is an open one: could you tell me a chronological history of the decision-making process. However, I pay attention and ask for precision about certain features of the process which are: the dates-duration of the phases; the presence of the other actors in each phase; the starting point of each phase; the topics of negotiation; the means of communication; the outcomes of each phase. So, when does my data collection finish and my data analysis start? The boundary is rather blurred.

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A mixture of qualitative and quantitative methodologies has been used in this research. In other words, as Denzin and Lincoln put it, the methodology used in this research is a kind of 'bricolage', that is, "a professional do-it-yourself work which strategically combines different conceptual tools, data collection and data analysis methods in order to provide solutions to concrete problems" (Denzin N. K. and Lincoln Y. S., 2003, p. 3).

II.2. Data Collection Methods

Two Techniques

The data have been collected through two techniques. These are face-to-face open and semi-structured interviews with the actors, and (electronic and paper) documents edited by the actors, that is, by the public authorities and the NGOs. The list of the interviewees and of the documents gathered can be found in the appendix entitled "Sources of Data". More specifically, the collected documents are newsletters, web sites, minutes of public meetings, and some minutes of the elected decision-makers meetings. These documents have been gathered along the interviews and through researches on the internet. The strengths of documentation are: stability, it can be reviewed repeatedly; unobtrusiveness, it is not especially produced for the study); and exactness, it contains exact names, references, and details. However, one must be careful in selecting documentation due to the dangers of 'bias selectivity' if the collection is incomplete (see Yin R. K., 2003, p. 80 and Creswell J. W., 2003, p. 186). Furthermore, the access to certain documents might be deliberately blocked by some involved actors because they want to defend their own interests; this is, by the way, one of the reasons why only completed decision-making processes have been selected.

The interviewees are at least one member of each public authority in charge of the waste treatment (*i.e.* a grouping of *communes*), and at least one member of each mobilised NGO[32]. The interviews were mainly carried out through phone, but a few ones were face-to-face. The strength of the interviews is that they can produce insights. The human affairs can be reported and interpreted through the eyes of specific interviewees, and well-informed respondents can provide important insights into a situation. However they are subject to bias because they

[32] The case of *Calce* is particular since the grouping of *communes* successively selected at least four sites in four municipalities. In front of the opposition of the town councils, the grouping of *commune*s had to give up the sites. The mobilisation of the NGOs around these sites was unclear. So, the study focuses on the NGOs which mobilised around the last site, the one of *Calce*.
See the appendix "The Ten Household Incineration plant Projects" for further details about this case.

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always result from the interaction between interviewer and interviewee; moreover information are filtered through the views of interviewees (see Yin R. K., 2003, p. 80 and Creswell J. W., 2003, p. 186). In other words, interviews are not a neutral collection of data. This is one of the reasons why two types of actors having divergent interests have been interviewed: the public authorities, and the NGOs. These 'double' interviews enable a cross-check of the information gathered. Finally, a drawback of the interviews is that they are time consuming.

Finding the Interviewees

The name and addresses of each of the ten public authorities were easily gathered through internet and public directories. But, it was a more difficult first to identify and then to find the addresses of the NGOs. Three sources of information have been used to overcome this difficulty:

- the list of the NGOs which participate to the Local Commission for Information and Monitoring (in the cases in which the incineration plant has been built up);[33]
- the (online) directory of the NGOs members of the national NGO *Coordination du CNIID* (*Centre National d'Information Indépendante sur les Déchets*, National Centre of Independent Information on Waste);[34]
- the snowball sampling, asking to the interviewed NGOs and grouping of *communes*: "18. Which (other) NGOs mobilised around the incineration plant project?"[35]

For the ten cases studied, a total of twenty-five NGOs were identified.[36] Out of these twenty-five NGOs, twenty-two 'full' interviews with at least one member of each NGO were realised. For three NGOs, it was possible to realise only a 'short' interview, gathering little data. Finally, as I have already stated in section II of this chapter, the two mobilised NGOs of the case of *Nîmes* refused to answer or simply did not respond. Because of the impossibility to gather information about these two NGOs, the case of *Nîmes* has finally been removed from the study.

[33] Information gathered through phone interviews with the *grouping of communes*, and with the NGOs.
[34] The directory is available at www.cniid.org/coordination/annuaire/annuaire.pdf , access date: 5 December 2006.
[35] See appendix "Questionnaire for the NGOs".
[36] See figure 4 in the section III of chapter 3 "Structuring of the NGOs' Mobilisation" for further details about these NGOs.

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Carrying out the interviews: two main steps

The interviews were carried out in two steps. In a first step, in order to provide an insight into the structure of the decision-making processes, two cases (2. *Angers* and 5. *Lasse*) have been selected, and some open-interviews were carried out. These two cases were selected because one decision-making process (Case of *Angers*) ended with the abandonment of the incineration plant project, while the other one (*Lasse*) ended with the opening of the incineration plant. In both cases, one face-to-face open interview was conducted with one or two members of each public authority and of each mobilised NGO. A total of seven interviews were thus carried out. Open interviews were preferred to semi-structured because at the outset of the empirical research I had little clue about the actual structure of the decision-making processes, the actors involved, and about the kind of information I could actually gather from the interviewees. Moreover, personal face-to-face interviews were preferred to phone interviews because interviewees are more likely to spend from one to three hours in a meeting rather than on the phone. Furthermore, non physical meetings eliminate the non-verbal communication. So to get this first insight about the public engagement and the NGOs mobilisation of scientific knowledge, two open questions were asked to the public authorities:

1. "Could you tell me a chronological story of the decision-making process from the very beginning until the decision to give up/the opening of the facility?", and "During this story telling, could you specify the main dates and the actors involved?";
2. "How and when did you communicate with the public?";

and two others were asked to the NGOs:

1. "Could you tell me a chronological story of your engagement from the moment when you engaged until the abandonment of the project/the opening of the facility?", and "During this story telling, could you specify the main dates, the actors involved, and your modes of action?".
2. "Did you seek scientific knowledge?" "What were your sources?"

In a second step, knowing the overall structure of the decision-making processes and knowing what kind of information the interviewees were able to give, semi-structured interviews were carried out on the telephone. To be more precise, the interviewees were first contacted through an e-mail which introduced the project and me as the researcher. Then, the day after, they were contacted by phone. In order to have a top-down support for these

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requests of interview, a web site on the personal web pages of the European University Institute (http://www.eui.eu/Personal/Researchers/christophevoineau/Index.html) was created. This web site also introduced the research and the researcher, but in a more detailed way than in the e-mail. Most of the people contacted answered positively at the first request. However, if almost all the NGOs contacted were fully available, the three public authorities of the three most controversial cases hesitated a great deal. Finally they accepted but they provided little information. For each case, the public authority was interviewed first because it is the project manager, and thus it has the most comprehensive view of the decision-making process structure and of the actors involved. Then, in a second time, the NGOs were in their turn interviewed, and the information gathered completed and cross-checked. The details of the semi-structured questionnaires are presented in chapters 6 and 8.

Legal Framework

To finish, the legal framework concerning the distribution of power between the public authorities and concerning the public involvement have been drawn directly from the French *Codes, Code de l'environnement*, *Code Général des Collectivités Territoriales, Code de l?urbanisme,* and *Code Civil*.

II.3. Data Analysis Methods

Three data analysis methods were used to answer the six research questions. As I have already stated, the data analyses are detailed in the respective chapters and sections; only the main lines of the analyses are introduced below.

The data analysis to answer a set of questions about public engagement is rather quantitative. It is made of three steps corresponding to the three questions. First, the actual public engagement was assessed with the drawing of charts representing the actual public engagement along the decision-making processes. More precisely, the decision-making processes were divided into three *'key chronological stages,'* and a property-space of the public engagement mechanisms has been developed. Then, for each type of mechanism and for each stage, the number of public engagement initiative has been counted. Finally, charts visualising at each chronological stage the number of public engagement initiatives of different kinds have been drawn up. Second, in order to assess the political will to engage the public, these charts are confronted with the legislation framing the public engagement. At last, the impact of the public engagement on the decision-making processes is made confronting

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for each case the actual public engagement with the outcome on one hand, and with the degree of controversy on the other hand. While the outcome (abandonment/completion) is easy to determined, the degree of controversy is defined through the development of a typology based on the mobilisation of the engaged NGOs: the more the NGOs were active, the more the decision-making process was controversial.

The data analysis methods employed to answer the questions about the causes of the possible scientific ignorance of the NGOs, and about their sources of scientific knowledge of the NGOs, are similar. The core of the analysis consists of the setting up of tables in order to classify the data collected during the semi-structured interviews. First, two property spaces have been built. Then, exploiting the semi-structured interviews made with the NGOs, these property spaces have been refined through the drawing of successive more elaborated tables. Finally, two typologies, one for the causes of ignorance, and another one of the sources of scientific knowledge of the NGOs, have been built.

The methodology employed in order to answer the last question about the role of scientific expertise in the discourses of the NGO is qualitative: this is methodology inspired by the grounded theory methodology. The analysis has been made with the software Atlas-ti.

III. Summary-Conclusion

The cases selected for carrying out this multiple-case study are the ten most recent decision-making processes (at the time of the beginning of the empirical research) for the setting up of household waste incineration plants in France. These decision-making processes ended indiscriminately by the realisation or the abandonment of the incineration plant project; the cases selected are thus finalised/completed decision-making processes. Furthermore, the decision-making processes have not been selected according to their degree of controversy: the analysis will reveal if they were controversial or not. The aim of this non-discrimination concerning the outcome and the degree of controversy is to make possible the assessment of the impact of the public engagement on the outcome and on the degree of controversy. Household waste treatment, and more particularly, waste incineration are major topical concerns in France. A historical overview of the dioxin-incineration issue in the French media shows a development of controversies since the middle of the 1990's. Moreover, at the time of the selected decision-making processes, there was a great deal of uncertainty about the hazard that dioxins emitted by incineration plants pose to health. Thus, the settings up of

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household waste incineration plants are typical technical decision-making processes, and are possibly controversial, with the societal controversy stemming from scientific uncertainties.

The methodologies used in this research result from a 'professional bricolage', and vary according to the research questions, at least for the data analysis. While the data collection method is eminently qualitative, data analysis methods are a mix between qualitative and quantitative methods. The data have been collected from semi-structured interviews made with the public authorities and the engaged NGOs. Documents (including web site) that these both actors published have also been collected. The interviews with two types of actor, public authority and engaged NGOs, has enabled a cross-checking of the data collected. The data analysis method for the first part of the research concerning the public engagement is rather quantitative, with the drawing of charts visualising at each chronological stage the number of public engagement initiatives of different kinds. As for the second part of the research concerning the public mobilisation of scientific knowledge, the data analysis method is rather qualitative. The possible scientific ignorance of the NGOs and their sources of scientific knowledge have been analysed with the setting up of successive tables, exploiting the data collected through the semi-structured interviews, while the analysis of the discourses of the NGOs have been realised using a variant of the Grounded Theory methodology.

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Chapter 3
Setting up of Incineration Plants in France: Decision-Making Processes and Involved Actors

This chapter describes the overall structure of the ten selected decision-making processes and the actors involved. Even if the setting up of new incineration plants is within the competences of local elected decision-makers, the French law sets them in a national legal framework. Consequently, the decision-making processes of the ten cases have a similar structure, and the types of actors involved are the same. The two principal types of actors of the decision-making processes are the public authorities and the public, at least in the perspective of this research. This chapter is structured around three sections. The first section deals with the overall structure of the decision-making processes, while the second one introduces the actors engaged in the decision-making processes, detailing the distribution of power between the concerned public authorities. At last, in section III the engaged NGOs are detailed because they are present in the ten decision-making processes, and they play an important role; at least with regard to the public engagement.

Each of the ten decision-making processes is detailed in the appendix "the ten decision-making processes": A chronological story is presented, including the dates of the key events, and the characteristics of the public authorities in charge of the waste treatment and the public are detailed.

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I. The Decision-Making Processes Structure: An Overview

The aim here is to give an overview of the ten decision-making processes as they took place in the ten studied cases and not to model them. The modelling is the subject of chapter 4 "Public Engagement and Controversies: Two Property Spaces", which establishes the theoretical framework for the analysis of the public involvement.

I.1. The Main Lines of the Ten Decision-Making Processes

From the twelve semi-structured interviews conducted with the ten public authorities in charge of setting up a waste treatment facility, and from the study made by Isabelle Dubien and Yann Laurans about the role of the sanitary arguments in the processes of setting up of incineration plants (Dubien I. and Laurans Y., 2000), the decision-making processes can be roughly described in terms of a chronological sequence of nine phases; some of the phases overlap in time while some others may be inverted.

The decision-making processes starts with a group of *communes* which makes a joint decision to set up a waste treatment facility. They set up a legal body called "grouping of *communes*", which is composed of representatives of the *communes*; the grouping of *communes* becomes the manager/coordinator of the project. Then, the above body solicits technical advice from scientific and technical experts in the *communes*' own waste treatment departments (where they exist) as well as from various public bodies/authorities and from private companies. Following these studies, it selects a technical solution for the waste treatment; in the cases studied, this is incineration. The third step consists of the location of the facility. The choice is made according to 'technical criteria': accessibility for lorries and trains, location at the 'barycentre of the population,'[37] and so on. However, the grouping of *communes* can not impose the choice of the site to the hosting municipality because this later is in charge of the planning permission on its territory: the hosting municipality can prevent the setting up of the incineration plant by not granting the planning permission. During the fourth phase, the grouping of *commune* specifies the characteristics of the incineration plant, such as the capacity, or the technology of the furnaces. On the bases of these specifications, it

[37] 'Barycentre of the population' is a technical term used by the interviewees. It means that the location is chosen according to the distance between the site and the urban centers considering the population of these urban centers. For example, let's consider two towns A and B separated by 10 km. If both towns had the same population, for example 10.000 inhabitants each, the barycentre would be in the middle, 5 km away from A and B. If A had 10.000 inhabitants and B ten times more, that is 100.000, the barycentre would be at 9 km from A and 1 from B. The aim is to minimize the kilometres that the total amount of wastes will have to make to reach the waste treatment facility. This technical term was used by the interviewees.

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selects the builder and the development company which is going operate the facility. In the ten studied decision-making processes, these are private companies. During the following phase, an independent enquiry commission, set up by the *Préfet*,[38] carries-out a public enquiry. This commission gathers the observations and remarks of the development company, of the local-decision makers, and above all of the residents and local NGOs opinions and proposals. During the sixth phase, the development company and the grouping of *communes* request together from the *Préfet* an authorisation to operate the incineration plant. The penultimate phase is the evaluation of this request by the *Préfet*. That is, the *Préfet* reads the conclusions of the public enquiry and asks the local branch of the technical services of the concerned ministries (sanitary, agricultural, transport, etc.) for their opinion about the incineration plant project. Then he/she grants, or not, the authorisation to operate. Obviously, such an authorisation is required for the pursuit of the project. Once the authorisation is granted, the building starts and the decision-making process ends by the official opening of the incineration plant.

The setting-up of an incineration plant is a very long process. The selected decision-making processes lasted 8 years in average: they began at the beginning of the 90's and ended between 2003 and 3005. More precisely, they lasted between six and eleven years, except in the case of *Angers*, where the process lasted only 2 years.[39]

I.2. Guidelines for decisions: *département* or *inter-département* plan for the disposal of household and similar waste

The choice of the waste treatment solution made by the grouping of *communes* is conditioned by a framework plan. Under the terms of article L. 541-15[40] of the *Code de l'Environnement*, the decisions made by legal entities under public law and their concessionaries in the waste disposal sector have to be compatible with the *département* or

[38] The *Préfet* is the local representative of the French State. See below sub-section II.1 "Distribution of Power among the Public Authorities" for further details.
[39] See the appendix "the ten decicion-making processes" for further details about each of the ten decision-making processes.
[40] *Décret n° 96-1008 du 18 novembre 1996 relatif aux plans d'élimination des déchets ménagers et assimilés (Journal Officiel du 24 novembre 1996)* amended by *décret n° 2005-1472 du 29 novembre 2005 (Journal Officiel du 30 novembre 2005).* The last modification of 2005 is about the authority responsible for the setting-up of the plan.

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inter-département plan for the disposal of household and similar waste[41]. Such a plan aims to organise the collection, sorting and treatment of waste at the level of the *département:*

> "II. […] [the plan] 3) Lists the priorities to be chosen, bearing in mind, in particular, foreseeable demographic and economic evolutions:
> a) For the set-up of new facilities, and may indicate the geographical areas that seem best suited for this purpose;
> b) For the collection, sorting and treatment of waste in order to guarantee a high level of environmental protection bearing in mind the economic and financial means required to implement them.
> III. - The plan takes account of the needs and capacities of the neighbouring zones outside its scope of application and the *inter-commune* cooperation proposals.
> IV. - Among the priorities chosen, it must provide for centres for the storage of ultimate waste originating from the treatment of household and similar waste."

Thus, the choice of a technical solution (i.e. incineration or another technique such as methanisation or composting) for the waste treatment by a grouping of *communes* can be constrained. However, the *département* plan has to take into account the inter-*commune* cooperation proposals, and the *communes*, grouping of *communes*, and existing waste treatment mixed syndicates participate in the drawing up of these plans. In other words, to a certain extent, the grouping of *communes* can choose incineration at the time of the drawing up of the *département* plan.

In most of the decision-making processes, the groupings of *communes* were totally free to select the technical solution they preferred. However, in three cases, the incineration plant was already foreseen by the *département* plan.[42]

II. The Actors Involved In the Ten Decision-Making Processes

The actors who participate to the decision-making processes can be divided into three categories: public authorities, the public, and other actors.

II.1. Distribution of Power among the Public Authorities

This section has two aims: firstly, to draw the legal provisions which assign the competencies to the various involved public authorities; and secondly to state the 'effective' distribution of power between the public authorities in the ten cases studied. The sources of information of this sub-section are (i) the interviews made with the public authorities in

[41] Original label in French: *Plan départemental d'élimination des déchets ménagers et assimilés*.
[42] See appendix "The Ten Decision-Making Processes" for further details about the decision-making processes.

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charge of the waste treatment on one hand, and (ii) the *Code Général des Collectivités Territoriales* and the *Code de l'Environnement* which determine the distribution of power between the involved public authorities on the other hand.

Four public authorities are engaged in the setting-up of an incineration plant. These are the authority in charge of the collecting, sorting, and treatment of the mixed municipal wastes, the *Préfet*, the *Conseil Général* (≈county council), and the *Conseil municipal* (town council).

The Authority In Charge Of the Collecting, Sorting, and Treatment, Of the Mixed Municipal Wastes

The authority in charge of the collecting, sorting, and treatment of the mixed municipal wastes is obviously the most important in the decision-making process, since it is the public authority which contracts the project. Indeed, under the terms of article L. 2224-13[43] of the *Code Général des Collectivité Territoriales*, the household wastes collecting and treatment has to be managed by *communes* ("*communes"* means municipalities). However, a *commune* can transfer this competency to a public establishment for *inter-commune* cooperation (*établissement public de cooperation intercommuncale*), or to a mixed syndicate (*syndicat mixte*). A public establishment for *inter-commune* cooperation is basically a grouping of *communes* which want to elaborate common projects of development; it is a long term and multipurpose cooperation public establishment.[44] Mixed syndicates are public establishments which can be composed of *communes*, groupings of *communes*, and other legal entities under public law. They are medium-term and single purpose public establishments.[45] At last, on the demand of the *communes* or of the public establishments for *inter-commune* cooperation, the

[43] This article has been introduced in the Code by *Loi n° 99-586 du 12 juillet 1999, art. 71, Journal Officiel du 13 juillet 1999*.

[44] Under the terms of article L. 5210-1 of the *Code Général des Collectivités Territoriales* (*Loi n° 92-125 du 6 février 1992, art. 66, Journal Officiel du 8 février 1992*) "the progress of the *inter-commune* cooperation is based on the free willingness of *communes* to elaborate common projects of development, inside solidarity perimeters". In the terms of articles L. 5212-1, L. 5214-1 (*Loi n° 99-586 du 12 juillet 1999, art. 14, Journal Officiel du 13 juillet 1999*) and article L. 5215-1[44] (*Loi n° 99-586 du 12 juillet 1999, art. 5, Journal Officiel du 13 juillet 1999*), three kinds of public establishment for *inter-commune* cooperation exist: syndicate of *communes* (which is a grouping of *communes*), community of *communes* (which is a grouping of *communes* all in one piece and without any enclave), and urban community (which is a grouping of *communes* all in one piece, without any enclave, and with more than 500 000 residents at the moment of its creation).

[45] Under the terms of article L. 5711-1 of the *Code Général des Collectivités Territoriales,* a mixed syndicate is composed exclusively of *communes* (*Loi n° 99-586 du 12 juillet 1999 art. 24 Journal Officiel du 13 juillet 1999*) and of public establishments for inter-*commune* cooperation (inserted by *Loi n° 2004-809 du 13 août 2004, art. 176, Journal Officiel du 17 août 2004*), or of exclusively public establishments for *inter-commune* cooperation. A mixed syndicate can also associate territorial authorities (such as *regions* or *départements*), groupings of territorial authorities, and other legal entity under public law. (See *Loi n° 99-586 du 12 juillet 1999, art. 24, Journal Officiel du 13 juillet 1999*).

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management of waste treatment and of the ultimate waste disposals can be assigned to the *département*, that is to the *Conseil Général*.

As a matter of fact, in the ten decision-making processes, no *commune* provided alone for a waste treatment facility; the municipalities have preferred to cooperate with other neighbouring municipalities in order to share the cost of these expensive facilities. In the ten decision-making processes, the facility has to treat the wastes produced by tens or even hundreds thousands inhabitants. In nine out of ten cases, a mixed syndicate dedicated to the waste treatment has been created. These mixed syndicates are mainly composed of grouping of *communes*, and of smaller waste treatment mixed syndicates which are themselves a form of grouping of *communes*. Only in one case, that of *Angers*, was the public entity which set up an incineration plant project a public establishment for *inter-commune* cooperation. From now and onward, the public authority in charge of the collecting, sorting, and treatment, of the mixed municipal wastes will be designated by the term "grouping of *communes*".

The Conseil Général

The *Conseil Général* is the assembly of the elected local decision-makers at the level of the *département.* A *départemen*t is an administrative division of the French national territory which corresponds more or less to a county.[46] From July 1992 to November 2005, the drawing up of *département* or *inter-département* plan for the disposal of household and similar waste was within the competence of the French State, and since 1996 more specifically of the *Préfet*. However, on its demand the *Conseil Général* could take the initiative and the responsibility to draw up this plan. The situation has changed since November 2005: the drawing up of the *département* plan is exclusively within the competence of the *Conseil Général*, the *préfets* do not mage with these plans anymore.[47]

In the ten decision-making processes, the *Conseil Généraux* left to the *Préfets* the responsibility of the drawing up of the *département* plan. However, in two cases, in 2005, following local elections, the *Conseil Généraux* took the responsibility of the drawing up of

[46] The French territory is divided in 22 regions, which are themselves composed of a series of *département* (from 2 to 8). Each *département* is itself divided in *cantons* (from 15 to 79). The *cantons* are composed of municipalities called *communes* (from a few units to a few dozens). Because of their competencies, *départements* are the most important administrative division in France, more than the regions. See the map of France in section II.2 of chapter 2.

[47] Loi n°92-646 du 13 juillet 1992, art. 1 JORF 14 juillet 1992.
Décret no 96-1008 du 18 novembre 1996 relatif aux plans d'élimination des déchets ménagers et assimilés, art. 3.
Décret n° 2005-1472 du 29 novembre 2005 modifiant le décret n° 96-1008 du 18 novembre 1996 relatif aux plans d'élimination des déchets ménagers et assimilés, art. 4.

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the *département* plan. These changes to who drew up of the *département* plans marked the abandonment of the concerned incineration plant projects in these two cases. Thus, it could be the case that in a *Conseil Général*, which is a collective body, there existed many more veto points, and/or that a consensus may be harder to achieve on controversial issues. In other words under the presidency of the *Conseil Général* the drawing-up of a *département* plan may be more *political* in its mode of operation while with the *Préfets* it may be more *technocratic*.

The Préfet

The *Préfet* is the representative of the French State at the local level of the *département*. He can play three roles in the decision-making process. First, as it has already been stated above, until 2005, he had by default the initiative and the responsibility for the setting-up of the *département* or *inter-département* plan for the disposal of household and similar waste. Consequently, he may influence the choice of the waste treatment technique, their numbers, and their locations.

Second, as for the public engagement, he has the power to set-up a Local Commission for Information and Monitoring *(Commission Local d'Information et de Surveillance*). This is a place where the NGOs can directly receive information from the project manager (*i.e.*the grouping of *commune*) and from the development company. [48]

Last but not least, he is the authority which grants the authorisation to operate the incinerator. Indeed, under the terms of L. 511-1[49], L. 511-2 of the *Code de l'Environnement* and of *Décret n° 53-578 du 20 mai 1953* (successively modified) which defines the facilities as being subject to authorisation or to declaration, incineration plants and others type of waste treatment facilities (composting, landfills, and crushing) are 'classified' for the protection of the environment[50] and they are thus subject to authorisation by the *Préfet*. Three legal obligations condition the granting of this authorisation by the *Préfet*. Firstly, under the term of article L. 512-1[51] of the *Code de l'Environnement,* the applicant for the authorisation (*i.e.* the

[48] See chapter 5 "Public Engagement: Legal Framework", sub-section II.1, for more information about the Local Commission for Information and Monitoring.
[49] *Loi n° 2001-44 du 17 janvier 2001, art. 11, IV Journal Officiel du 18 janvier 2001.*
[50] Classified facilities for the protection of the environment are "facilities operated or owned by any public or private person or entity, which might present hazards or drawbacks for the convenience of the neighbourhood, or for public health and safety, or for agriculture, or for the protection of nature and the environment, or for the conservation of sites and monuments or elements of the archaeological heritage" (Environmental Code, Legifrance and Michael Faure, October 2006, article L. 511-1)
[51] Amended by *Loi n° 2003-699 du 30 juillet 2003, art. 4, art. 25, Journal Officiel du 31 juillet 2003,* and *Loi n° 2006-11 du 5 janvier 2006, art. 77, Journal Officiel du 6 janvier 2006.*

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grouping of *communes* and the development company) has to supply a 'risk study' specifying the risks to which the facility may expose the interests referred in case of an accident, for whatever reason.[52] Secondly, under the terms of article L. 122-1[53] of the *Code de l'Environnement,* an impact study enabling the assessment of the impacts of the facility must be included.[54] These two points mean that that the applicants (i.e. the grouping of *communes* and the development company) have to provide some technical-scientific expertises. Thirdly, in the terms of article L. 512-2 of the *Code de l'Environnement,* the authorisation can be granted only after the realisation of a public enquiry, and after considering the possible hazards or drawbacks of the project listed in the previous paragraph. That means that some form of participation of the local NGOs and of the residents to the decision-making process is provided by the law.[55] The authorisation takes place toward the end of the decision-making process and marks the end of the study of the project and the beginning of construction work. Only in two cases (*Le Havre, and Guichainville*) did the grouping of *communes* and the builder take the risk to start the building before the granting of this authorisation.[56]

The fact that waste treatment facilities are subject to authorisation entails that the very final decision for the setting-up of a waste treatment facility does not depend on the elected local decision-makers of the grouping of *communes*, but on the administrative representative of the French State in the *département*, i.e. the *Préfet*.

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[52] The authorisation may be granted only if these hazards or drawbacks can be prevented by measures which are specified in the ruling of the *Préfecture*.

[53] *Loi n° 2002-276 du 27 février 2002, art. 147, I Journal Officiel du 28 février 2002,* amended by *Ordonnance n° 2004-489 du 3 juin 2004, art. 1, I, II, Journal Officiel du 5 juin 2004*, and *Loi n° 2005-1319 du 26 octobre 2005, art. 1, Journal Officiel du 27 octobre 2005*.

[54] Under the term of article L. 122-3, paragraph 2, of the *Code de l'Environnement* " […] The content of the impact study, […] contains as a minimum an analysis of the initial state of the site and its environment, a study of the modifications that the project would bring about, a study of its effects on health, and the measures envisaged to eliminate, minimise and, if possible, compensate for harmful consequences on the environment and health; in addition, for transport infrastructures, the impact study contains an analysis of the costs at community level resulting from pollutions and nuisances and the advantages induced for the community, along with an evaluation of the energy consumption resulting from the operation, particularly from the traffic movements that it causes or prevents; […]". This article initially set up by *Loi n° 2002-276 du 27 février 2002, art. 147, II, Journal Officiel du 28 février 2002*, has been subsequently modified by *Ordonnance n° 2004-489 du 3 juin 2004, art. 1, I, II, Journal Officiel du 5 juin 2004,* and *Loi n° 2005-1319 du 26 octobre 2005, art. 1, Journal Officiel du 27 octobre 2005*.

[55] See Chapter 5 "Public Engagement: Legal Framework", section I.2, for further details about the public enquiries

[56] See appendix "The Ten Decision-Making Processes" for further details about the ten decision-making processes.

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The Conseil Municipal

The *Conseil Municipal* (town council) of the *commune* hosting the incineration plant is the (elected) public authority which delivers the planning permission. Consequently, it has the power to refuse the sitting of the incineration plant on its territory. No incineration plant can be constructed without its authorisation. Moreover, the town council of the hosting or a bordering municipality has the right to create a Local Commission for Information and Monitoring.[57]

II.2. The Public

The public is not an unproblematic concept. And thus it is necessary to specify who the public is in this study. In the ten cases studied here the public can be divided into three groups: the NGOs, the residents, and the formal or informal groups of economical interest. The residents are the natural persons living on the territory concerned by the facility, that is, on the territory of the grouping of *communes*. They may be engaged in the decision-making processes by the public authority through public meetings, or public enquiries. The informal or formal groups of economical interests are farmers (in the cases 1. *Gueugnon*, 3. *Thiviers*, 5. *Lasse*, and 11. *Vaux-le-Pénil*,), and viticulturists (in the case 9. *Calce*).[58] Among these three types of public, the NGOs played the most important role in the decision-making processes, both in terms of presence and in term of mobilisation. Indeed, in each of the ten cases, at least two local NGOs were engaged. Furthermore, the NGOs group together some residents, some members of the groups of economical interests, and some other local NGOs. In other words, most of the persons who stood against, or at least who were worried by, the incineration plant project joined, or had the possibility to join, a local NGO. To sum up, in the first part of the research about the public engagement, the three types of public are taken into account, while in the second part about the public mobilisation of scientific knowledge the study focuses on the NGOs. Due to the central role of the NGOs as mobilisation of the public, the structuring of the NGOs' mobilisation is detailed in section III below.

[57] See chapter 5 "Public Engagement: Legal Framework", section II.1, for more information about the Local Commission for Information and Monitoring.
[58] The farmers mobilised through three ways: through local NGOs, through an informal way, or through the *chambre d'agriculture* (chamber of agriculture).

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II.3. Other Actors

The category "other actors" groups together the actors which participated to the decision-making processes but who are not central for this research about public involvement. Two main "other actors" have been identified: the development company and the building company. The development company, which is private, is in charge of operating the incineration plant. Consequently, it actively participates in the formal written process of requesting authorisation to operate, together with the grouping of *communes*. Furthermore, the development company is member of the Local Commission for Information and Monitoring. In the studied cases the development companies are Novergie (SITA/Suez), CGEA-Onyx (Veolia Environnement), the two most important, and also Tiru (EDF/Vivendi/Suez), and THIDE (Groupe Gaz de France, Groupe Institut Français du Pétrole, Maguin). The second "other actor" is the company which builds the incineration plant.

The political parties were not significantly present with regard to the public engagement. In the open and semi-structured interviews, it has never appeared that the political parties tried to sponsor or merely favour any public debate or participatory mechanism; not even the green parties emerged from the interviews. From a structural point of view, political parties are unlikely to play a direct role in the decision-making processes. As I have stated above, the groupings of *communes* in charge of the waste treatment are composed of municipalities and of other groupings of *communes*, and only one representative of these later public entities participates to the meetings of the grouping of *communes* in charge of the waste treatments. Some elected decision-makers member of political parties, however, were member of some of the local mobilised NGOs (for example *Coordination Environnmentale des Pyrénnées Orientales* in the case of *Calce*, or *Collectif Inciner'àtort* in the case of *Angers*). Moreover, in two cases (1. *Gueugnon*, 3. *Thiviers*), the changing of majority at the *Conseil Général* has lead to the abandonment of the incineration plant project.

III. The Structuring Of the NGOs' Mobilisation

This section analyses the structuring of the NGOs' mobilisation. In a first step, a typology of the NGOs is set up. Then the relationships among the NGOs are analysed. Finally, the positioning of the NGOs concerning incineration and their motivations for the mobilisation are explored.

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III.1. Selection of the NGOs and Data Collection

The NGOs selected are all the NGOs that were involved in the ten selected decision-making processes. The data have been gathered mainly through phone and personal face to face semi-structured interviews (questions 1 to 6 of the semi-structured questionnaire)[59], and to a less extent through the web-sites of the NGOs.[60] 22 out of the 27 identified NGOS have been interviewed. As I have already stated in chapter 2, because of the impossibility to interview the two NGOs *ICI-ROM* and *ADACIP*, the case of *Nîmes* has finally been excluded from the selection of the cases. So there are finally 10 cases with twenty five identified NGOs. Among the three NGOs which have not been interviewed, two did not answer to my requests (*Sauvegarde de l'Anjou*, and *Frenne66*), and the third one (*Nord Nature*) answered very superficially. The identified NGOs are listed in the following section.

III.2. The Types of NGOs

First of all, the NGOs which engaged in the decision-making process are all local; no national NGO was directly involved (the relationships between the local and the national NGOs are specified in the following sub-section). In other words, a local mobilisation faced a local project. The members of these local NGOs, mostly natural persons, come from the area surrounding the sites of the incineration plants, that is, principally from the neighbouring housing and from the town hosting the facility, but also from the neighbouring towns, and sometimes from the *Département*. A minor section of the members is made up of legal entities – these are to a very large extent existing local NGOs – while a few private companies are also present.

Two types of NGOs can be identified: the '*ad hoc*', and the *'existing'* NGOs. The first category has been labelled as '***ad hoc***' because they are NGOs especially created on the occasion of the setting up of an incineration plant (See figure 4 below), and their main scope has been to prevent the building of the incinerator. More over, they very often proposed alternative techniques for the waste treatment or alternative waste treatment policy. Therefore, they are mainly *'waste oriented'*. However in one case,

[59] See the appendix "Questionnaire for the NGOs" for further details about the asked questions.
[60] See the appendix "Sources of Data" for further details about the list of the consulted web sites; and the list of the interviews carried-out.

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Caption:


(continuous line) : '*ad hoc*' NGO

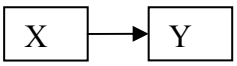

(broken line) : 'existing' NGO


(grey fill) : Environmentally oriented NGO


(white fill) : Waste oriented NGO

(hachure fill) : Civic oriented NGO


: NGO for which no 'full' interview could be realised



: NGO X is member of NGO Y

In the first column, the eleven cases studied in this research are listed, while the boxes represent the NGOs which mobilised in these eleven cases. Then, there is one column for each net: *Coordination du CNIID*, Independent, and *France Nature Environement (FNE)*. So the NGOs which are members of *Coordination du CNIID* are in the column '*Coordination du CNIID*'. The column 'Independent' contains the NGOs which are not linked at all to any national NGO. NGOs the national NGO *France Nature Environnement (FNE)* are listed in the last column. To finish, the NGOs which overlap the border line between two columns are not formally member of *Coordination du CNIID* or *FNE* but are nevertheless linked to one of these two national nets.

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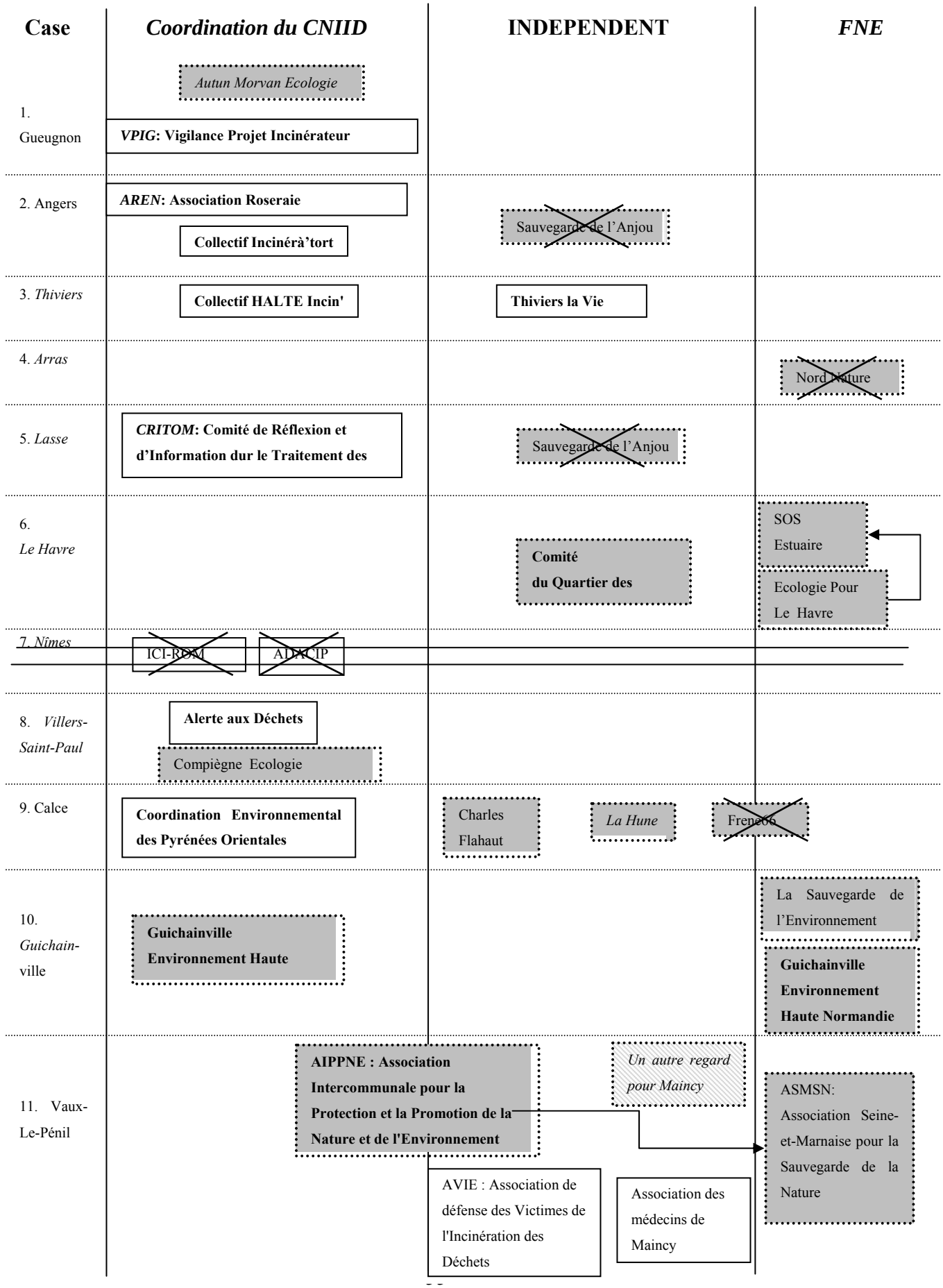
Figure 4. The 25 NGOs engaged in the ten decision-making processes



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one NGO had a slightly different scope: in the case of *Vaux-le-Pénil*, the *ad hoc* NGO *Association de défense des Victimes de l'Incinération des Déchets (AVIE)* had above all the aim of obtaining an indemnity for the residents, claiming that they are victim of the pollution produced by a previous 'old' incinerator. Among the four forms of organisation of the social movements identified buy Donatella della Porta, the *'ad hoc'* NGOs are organised in the same way as the 'citizen committees'.[61] Indeed, they have a strong local identity, a strategy of actions which favour protests, and the organisation is mostly participatory.[62]

The '***existing***' NGOs are NGOs that were created before they knew about the incineration plant project. The label *'existing'* has been chosen because these NGOs already existed when the incineration plant projects were set up; they were not created to fight against the incineration plant project. In fact, they were created to protect the environment in a broad way; they are *'environmentally oriented'*. Indeed, before the incineration plant project they were used to militate for the protection of the environment generally speaking: to them, the incineration plant was considered another source of pollution. Incineration is an issue to be dealt with, among others they consider also important. However, in two cases, the NGOs are not *'environmentally oriented'*. In the case of *Vaux-le-Pénil*, the existing NGO *Un autre regard pour Maincy* has a *'civic'* scope: it aims to address criticisms to the policy of the municipality of Maincy. And in the case of *Le Havre*, the NGO *Comité du quartier des Neiges* has a more specific scope than the protection of the environment generally speaking: they fight against the neighbouring industrial pollution, including an old incineration plant which has been finally closed at the beginning of the 2000's. The organisation of the *'existing'* NGOs is similar to the 'groups of public interests' with a strategy mainly made of

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[61] "Four forms of organisation of social movements:
1. 'Group of public interest': characterised by a universal identity, a single issue, a strategy of lobbying and meeting and a bureaucratized organisation with formal membership;
2. 'Association of new volunteers': characterised by a universal identity, strategy of offering of services, permanent organised structure, participative and reticular;
3. 'Auto-managed social centre': characterised by a universal identity, strategy of counter cultural intervention, with moments of radical protests, participative structure of organisation;
4. 'Citizen committee': characterised by a local identity, strategy of actions which favours protests; structure of organisation is participative, flexible, with a low level of coordination."
(della Porta Donatella, 2004, p. 13-14)

[62] See chapter 6 "Public Engagement in the Ten Decision-Making Processes", section I.2, for further details about the initiatives undertaken by the NGOs in the decision-making processes. In fact, in the case of *Vaux-le-Pénil* two NGOs did not protest. The NGO *Association de défense des Victimes de l'Incinération des Déchets (AVIE)* undertook some legal actions while the NGO *Association des Médecins de Maincy* lobbied the public authorities.

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lobbying and public meeting; and a formal membership. However, the identity is not universal but local. These NGOs claim the primacy of their municipal or *département* identity.

The distinction between '*existing*' and '*ad hoc*' NGOs stems from the first (prospecting) interviews. When I asked about the identity of the NGOs (date of creation, scope of the NGO), it clearly appeared that there were NGOs especially created to fight against the incineration plant on the one hand, and pre-existing environmentalist NGOs on the other hand. This distinction has been continuously reinforced as I carried out new interviews. This distinction is likely to be relevant in this research for two reasons. First, '*ad hoc*' groups are likely to engage in the decision-making processes in a more active way than *'existing'* NGOs; making the decision-making processes more controversial. Indeed *'ad hoc'* NGOs are recent, the members are probably highly motivated, and likely full of energy to sponsor many initiatives. Moreover, the rationale being to fight against the local incineration plant project, it is likely that they are aware that their actions will be limited to a few months, one or two years maximum. On the contrary, *'existing'* NGOs have to manage their human resources in a more accurate way in order to be able to act on the medium-long term. Second, *'ad hoc'* NGOs concentrate only on their local incineration plant project whereas *'existing'* environmentalist NGOs have to distribute their energy among various issues. Since they focus on only one issue, waste treatment and incineration, *'ad hoc'* may mobilise more scientific expertise than *'existing'* NGOs.

III.3. Relationships among the NGOs

Relationships among the Local NGOs

The relationships among the local NGOs mobilised around a given incineration plant project are quite tight. From the interviews, it appears that most of the NGOs worked together with the other(s) local NGO(s), that is, that they organised together initiatives such as petitions, protests, public meetings, and the preparation of the Local Commission for Information and Monitoring meetings, or at least that they were rather well informed about the initiatives organised by the others. In four cases, certain NGOs did not have tight relationships with the others. In the case of *Vaux-le-Pénil*, the numerous NGOs which mobilised (i.e. five) had only loose relationships among them. In the case of *Lasse*, the NGO *Charles Flahaut* did not have contact with the two other mobilised NGOs (*La Hune* and *Coorrdination Environnementale des Pyrénnées orientales*). The two latter groups consider

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the former as an association of botanists that does not care about incineration. In fact, *Charles Flahaut* was not opposed to the incineration plant project. The NGO la Sauvegarde de l'Anjou was present in two decision-making processes (*Angers*, and *Lasse*). In the two cases, this NGO had almost no contact with the highly active NGOs *AREN*, *Collectif Inciner'à tort*, and *CRITOM*. As a matter of act, *La Sauvegarde de l'Anjou* was not against the incineration plant project, and more generally was not opposed to waste incineration.

To conclude, almost all the NGOs were well informed about the actions of the others NGOs mobilised around the same incineration plant project, and consequently, they were likely to share scientific and technical knowledge they gathered.

Relationship among the Local and the National NGOs

Even though all the mobilised NGOs are local, they are not isolated in their local context. Indeed, two thirds of the NGOs, and at least one NGO in each of the ten cases, are linked to a national net of NGOs: either to the *Coordination du CNIID*, or to *France Nature Environnement* (see figure 4 above). To be more precise, nine out of the 25 NGOs are linked to the *Coordination du CNIID*, seven to *France nature Environnement (FNE)*. However eight NGOs are independent, that is, they are not linked to any national net.

CNIID (Centre National d'Information Indépendante sur les Déchets, National Center of Independent Information about Wastes*)* is a national NGO dedicated to the matter of waste treatment. *CNIID* introduces itself as an NGO that aims at: (i) informing about the toxicity of wastes in a general way, and also concerning specified types of wastes; and (ii) denouncing the sanitary and environmental damages linked to waste treatment, and proposing healthy alternatives. *CNIID* holds conferences on the whole French territory, sends documents to interested persons, and it proposes actions or events to be taken. However, the local NGOs are not members of *CNIID*, but of *Coordination du CNIID*. *Coordination du CNIID,* or more precisely, *Coordination Nationale pour la Réduction des Déchets à la Source* (National Committee for the Reduction of Wastes at the Source) groups together 290 local NGOs. *CNIID* provides *Coordination* with the secretariat. According to *CNIID*, the aim of the local NGOs members of *Coordination* is to fight against the existing or projected incineration plants or landfills, and to promote the reduction of wastes at the source as an alternative solution. Moreover, three times a year, *Coordination du CNIID* organises a national meeting

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in order to facilitate the exchange of experience between the local NGOs. At the local level, *CNIID* is not present as such, only the members of *Coordination* are active. [63]

France Nature Environnement (FNE) is a French national federation of local NGOs which aims to protect nature and the environment. Incineration of waste is only one of the various environmental themes *FNE* deals with. Around 3000 NGOs, spread across France, are member of *FNE*. Concerning waste incineration, *FNE* is not in favour of the setting up of new incineration plant, but it is not completely opposed either. *FNE* thinks that incineration is not a good solution for the waste treatment because of the sanitary risk and the environmental pollution it entails. Nevertheless, it also states that incineration plants could exceptionally be a solution for big cities, because in these cases no landfill is available in a reasonable range. Furthermore, *FNE* rejects the idea of a moratorium on incineration plants, in the name of the reality of the situation of the big cities.[64] *FNE* has three modes of actions: *FNE* and its member associations represent citizens in commissions of consultation at the local and national level; they lobby in order to change the French, European, and international legislations; and they educate and heighten public aw*AREN*ess.[65]

The organisations of these two national nets are thus similar to the organisation of their respective members. *Coordination du CNIID* works the same way as a 'citizen committee': characterised by the sum of the local identities (*i.e.* by the sum of local NGOs); a strategy of actions which favours protests; and a structure of organisation which is participative, flexible, with a low level of coordination. Conversely *FNE* is a 'group of public interest': characterised by a universal identity; a strategy of lobbying and meeting; and a bureaucratized organisation with formal membership.

In the ten cases studied, *Coordination du CNIID* and *FNE* are two distinct networks: the NGOs which are not independent are either part of *Coordination du CNIID* or part of *FNE*.

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[63] Source: *CNIID*, www.cniid.org/lasso.html, access date: 5 December 2006

[64] Sources : *FNE*, « Dossier : Incinération / Positionnement de France Nature Environnement sur la gestion des déchets et l'incinération », www.fne.asso.fr/PA/dechets/dos/dossiers_incineration.htm, access date: 18 June 2007

[65] As I have already stated, no national NGO is directly involved in the mobilisation at the local level. However, at the national level, on the dated 15 March 2007, 28 NGOs took position against incineration, signing the petition for a moratorium on waste incineration initiated by the grouping of NGOs *Alliance*. The petitioners are: ACIDD, *Acroporis*, *Action Consommation*, *Adéquations*, *Adome*, *Agir pour l'Environnement*, *Amis de la Terre*, APREIS, *Biosphere*, *Blue Initiative*, CNIID, *Cheminements*, *CoLLecT-IF*, CRII-GEN, *Ecoforum*, *Ecologie sans frontière*, *Europe des consciences*, *Fac Verte*, *Good planet*, *Greenpeace*, *Fondation Nicolas Hulot*, *Intelligence Verte*, *L'Age de Faire*, *Le Festival du Vent*, *Marais du Vigueirat*, MDRGF, *Objectif Bio*, and WWF. (Source : « *L'Alliance pour la Planète réclame un moratoire sur l'incinération et une politique ambitieuse de réduction des déchets* », www.lalliance.fr, access date : 15 June 2007)

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Only the NGO *Guichainville Environnement Haute Normandie* belongs to both nets (see figure 4 above). The choice to be part of one of the two networks exclusively is not surprising since *CNIID* is strongly opposed to incineration whereas *FNE* is not in favour of a moratorium on incineration plants. *Coordination du CNIID* is present in most of the cases (8 out of 10), whereas *FNE* is present in only three cases (see figure 4 above). Only in the two cases of *Arras* and *Le Havre*, is *Coordination du CNIID* absent whereas *FNE* is present.

Therefore, considering the relationships among the local NGOs on the one hand, and between the local and the national NGOs on the other, it is possible to conclude that all the NGOs are directly or indirectly in touch with a national network. That means that in each case, the local NGOs may receive scientific or technical information from a national NGO. Moreover, in the light of the positioning of the national NGOs, it is likely that the NGOs members of *Coordination du CNIID* will be more opposed to the incineration plant projects than the NGOs members of *FNE*.

III.4. Positioning Concerning Incineration and Motivations for the Mobilisation

Almost all of the interviewed NGOs (20 out of 22) declared that they stand against the local incineration plant project and more generally that they are against the principle of incineration. Only two NGOs are not against incineration: *Comité du quartier des Neiges* (case of *Le Havre*) and *Charles Flahaut* (case of *Calce*). The position of *Comité du quartier des Neiges* is that an incineration plant can be a solution if it is located in an appropriate place and if it respects the norms of pollution. As for *Charles Flahaut*, it felt that it was urgent to do something in order to close the landfill, and incineration was the 'less bad' solution. However, after the closure of the landfill and the building of an incineration plant, this NGO claims that it is necessary to monitor better incineration plants. A third NGO, *La Hune* (case of *Calce*), was not initially opposed to the project of an incineration plant. However, it changed its position because the sanitary risk appeared to them more important than they thought, and because incineration prevents the implementation of genuine selective sorting.

In response to the question "6. Why do you oppose this project of incineration plant?", the 20 NGOs which opposed to the setting up of an incineration plant mainly invoked the sanitary risk and the environmental pollution. Dioxins are the molecules which are by far the most criticized, but furans and heavy metals are also mentioned. To be more precise, as principal reason, seventeen NGOs invoked the sanitary risk, two did not talk directly about sanitary risk but about the non respect of the pollutant emission norms of an existing old incinerator, and

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one NGO talked only about the risk for agriculture. The other reasons invoked were the pollution of environment (6 NGOs), and a series of other various motivation: the location of the incineration plant (1), the non respect of the procedure concerning the impact study (1), the visual impact on architectural heritage (1), and the impact on the value of the residential patrimony. Thus, the reason why almost all the mobilised NGOs stand against an incineration plant is the sanitary risk.

IV. Summary-Conclusion

The ten decision-making processes have a similar structure and are thus actually comparable. In brief: a grouping of *communes* decides to set up a waste treatment facility, then it rapidly selects incineration as a solution; then it establishes the specifications of the incineration plants and selects a builder and a development company; in a third step, a public inquiry is carried out; finally, after the granting by the *Préfet* (the local representative of the state) of the authorisation to operate, the building starts and the facility opens. However, in three cases the incineration plant project was abandoned during the *'specifications'* stage. Moreover, the decision of the elected decision-makers of the grouping of *communes* is more or less constrained by the *département* plan for the disposal of household and similar wastes.

Among the actors involved in the decision-making processes, two have a major role with regard to public participation and public mobilisation of scientific knowledge: the groupings of *communes* and the local NGOs. The grouping of *communes* is the authority in charge of the setting up of a waste treatment facility, that is, is the project manager. However, three other public authorities condition the final decision: the mayor of the municipality which hosts the incineration plant since he personally delivers the planning permission through an order; the authority in charge of the *département* plan for the disposal of household and similar waste, that is the *Préfet* in the cases studied; and the *Préfet* again because he is the authority which grants the authorisation to operate and consequently he conditions the opening of the facility. Finally, the *Préfet* also has some prerogatives concerning the participation of the public: notably he is the authority which sets up the Local Commission for Information and Monitoring.

Among the three types of public – individuals, NGOs, and groups of economic interests – the most important is the NGOs, because of their omnipresence and of their actual mobilisation. While in the first part of this research concerning public engagement these three types of public are studied, the second part about the mobilisation of scientific expertise by the public focuses on the NGOs. In the ten cases, the NGOs which mobilised are local. Thus,

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local decision-making processes entailed local mobilisations. Two types of local NGOs can be differentiated: the *'ad hoc'*, especially created to stand against the incineration plant project, and the *'existing'* which are mostly environmental NGOs. In the respective cases, the local NGOs worked together, or at least, each NGO was regularly informed about the actions undertaken by the others. Even if these NGOs are local, they are not isolated: in each case, at least one NGO is linked to a national net. Two national networks have been identified: *Coordination du CNIID*, and *France Nature Environnement*. While *CNIID* deals exclusively with waste treatment and is strongly opposed to the principle of incineration, *FNE* is a generalist environmental NGO which thinks that incineration could be a solution in certain specific cases. The two types of local NGOs are respectively linked to the two national nets: the *'ad hoc'* NGOs are linked to *Coordination du CNIID*, while the *'existing'* NGOs are linked to *France Nature Environnement*. All but two out of the 25 local NGOs oppose the incineration plant project. The main reason for this opposition is the worry about the sanitary risk entailed by incineration plants, and more specifically by dioxins. Even if both types of local NGOs are opposed to incineration, in the light of the positions of the two national NGOs, it is likely that the *'ad hoc'* NGOs will be more opposed to the incineration plant projects than the *'existing'* NGOs.

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PART II

PUBLIC ENGAGEMENT MECHANISMS

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INTRODUCTION

This second part intends to answer the three first research questions, which concern the public engagement in the ten selected decision-making processes: first, "to what extent is the public actually involved in decision-making processes?"; second, "what is the political will to involve the public?"; and third, "what is the impact of the public engagement on the decision-making processes (i.e. on their degree of controversy, and on their outcome)?"

This part consequently consists of three chapters. Chapter 4 provides the theoretical framework and the main lines of the methodology. Chapter 5 establishes the legal framework of the public involvement in France; the comparison of the actual public engagement with this legal framework enables the assessment of the political will of the local decision-makers to engage the public. Finally, chapter 6 provides the answers to the research questions.

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Chapter 4
Public Engagement and Degree of Controversy: Two Property Spaces

This chapter provides the theoretical framework that will be used to answer to the first three research questions. The theoretical framework shall enable the classification of the public involvement mechanisms sponsored by the public authorities and the public, and the measurement of the degree of controversy of the decision-making processes. From here onward the processes/techniques/instruments which enable the involvement of the public will be collectively termed *'mechanisms'*. Section II provides a property space of the public engagement mechanisms, while section III develops a property space of the decision-making process according to their degree of controversy.

I. Public Engagement Mechanisms: The Typology Developed by Rowe and Frewer

In the first sub-section, the criteria for the development of a property space of the public engagement mechanisms are presented. Then, the second sub-section introduces the typology on which the property space is based.

I.1. Criteria for the classification of public engagement mechanisms

As Rowe and Frewer state, throughout western democracies, a growing number of mechanisms have been set up in order to enable public involvement, and the very existence of this variety of mechanisms implies uncertainty and confusion about what involvement consist of, that is, 'public involvement' lacks of precise definitions (Rowe G. and Frewer L.J. 2005).

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This lack of precise definition hinders the development of a pertinent property space of the public involvement mechanisms. A general definition of 'public participation' usually accepted is "the practice of involving members of the public in the agenda-setting, decision-making, and policy-forming activities of organizations/institutions responsible for policy development" (Rowe G. and Frewer L.J. 2005, p. 253). Such a definition enables the distinction of participation situations from non-participation situations where elected policy makers, with the help of nominated experts, take decisions with no further reference to the public. However, it does not enable the distinction between the various grades of involvement of the public. For example, the public may 'participate' by being passive recipients of information delivered by public authorities. In other words, the term 'involvement' covers different degrees of engagement of the public, from simple information given to the public to highly inclusive deliberative approaches, such as consensus conference or focus groups. Furthermore, in the literature, the labelling of highly similar mechanisms with different names and the use of a same name for very dissimilar mechanisms contributes to the confusion too. Confusion is such that some researchers might disagree with the scope of the mechanisms, which are thus, *a priori* and implicitly, excluded or included in research.[66] Finally, the confusion is also due to the fact that public involvement is an object of study of different fields of research such as Political Science and Science Studies. Even the list of typical mechanisms varies according to the field of research. For example, in the Political Science literature, Bacqué and Syntomer list ten main engagement mechanisms: assembly, referendum, committee of quarter, quarters' fund, participative budget, development community, citizen jury, consultative commission, participative strategic plan and community development plan, system of representation of the users of the public services (Bacqué M.-H. , Rey H. Sintomer Y., 2005). While, in a recent Science Studies article, Rowe and Frewer have identified "the eight most widespread engagement mechanisms": referenda, public hearings/inquiries, public opinion surveys, negotiated rule making, consensus conference, citizens' jury panel, citizen public advisory committee, and focus groups (Rowe G. and Frewer L.J., 2000).

As Bacqué and Syntomer claim, various typologies of the mechanisms may be developed, depending on the main dimension retained to classify the mechanisms (Bacqué M.-H. , Rey

[66] See Rowe G. and Frewer L.J. 2005 for a thorough discussion about the lack of unambiguous definitions and its impact on the quality of studies about public involvement in technical decision-making processes.

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H. Sintomer Y., 2005). These authors list four ways of classifying the mechanisms; the list is not exhaustive. The most obvious and easy typology, because it is the most concrete, consists of listing the mechanisms indicating the state of the variables which characterise them. A second way to develop a typology is to identify the type of participants. A third way to establish a typology according to the origin of the initiative of the participation: *bottom-up, top-down, or bottom-up* and *top-down intertwined*. At last, the temporality of the mechanisms (time limited, such as citizen juries or referendum or long term, such as participative budgets) can also be the main variable to develop a typology.

In order to specify what is meant by 'public involvement' in this research, through the development of a property space, it is necessary first to identify the intended scopes of the involvement of the public: is it to transform the public as a complementary/alternative source of information? Or is it to redistribute the power of the final decision between the public and the decision-makers? The present Science Study research is obviously interested in the former: as we have seen in chapter 1, this research focuses on the public involvement in order to overcome the problems of traditional scientific expertise. Of course, the involvement of the public as an alternative source for the elected decision-makers is also a form of empowerment of the public. In other words, this research focuses on the cognitive dimension of empowerment (i) agenda setting and (ii) framing of issues. Consequently, typologies such as the ladder of participation developed by Shery Arnstein (Arnstein S., 1969), in which the groups of mechanisms of public engagement differed along the single dimension of the re-distribution of the power to the public, are of limited interest in this research.[67] Consequently, the circulation of information between the public authorities and the public is a key element for the development of the property space of the public involvement mechanisms. Moreover, this property space must enable the classification of the various grades of involvement of the public: from mere communication to highly inclusive mechanisms. The typology developed

[67] In this pioneering typology, the interest of Arnstein is the distribution of power between citizens and decision-makers. She identified eight levels of participation. In order of increasing empowerment of the public these are: 1. Manipulation, 2. Therapy, 3. Information, 4. Consultation, 5. Placation, 6. Partnership, 7. Delegated Power, 8. Citizen Control), themselves grouped into 3 families (Non Participation, Tokenism, Citizen Power). This ladder of participation has been a basis for the building of many other typologies in the political science literature.

Moreover, the empowerment of the public is a tricky issue. Indeed, the distribution of power to some non-elected members of the public inevitably entails problems of input legitimacy (Scharpf F., 1999), that is problems of representativeness of the public participants (this not the case for the referenda). It seems that only election can guarantee representativeness of the people. Thus, in this perspective, it is better to engage the public as an alternative source of information (that is, opinions, but also knowledge) rather than as an alternative decision-maker.

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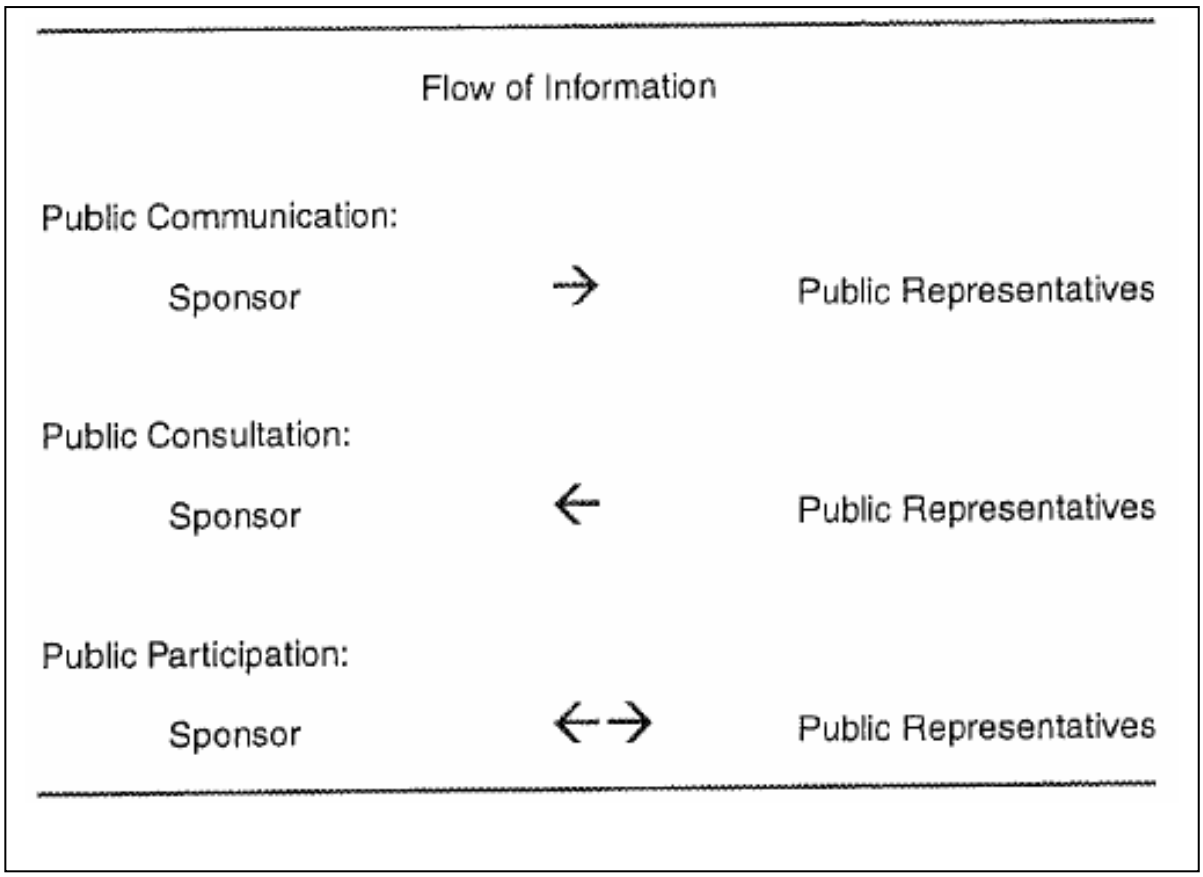
by Rowe and Frewer (Rowe G. and Frewer L.J. 2005) matches these two requirements. This typology has, however, a series of limitations.

I.2. The typology developed by Rowe and Frewer: advantages and drawbacks

The typology of public involvement mechanisms developed by Rowe and Frewer stems from the need to differentiate and classify the various involvement situations. The authors have developed their typology based on the analysis of a broad range of existing mechanisms, mainly in the Anglo-Saxon countries. Since this typology is the basis for the development of my own property space, only the main features of this typology are set out in this sub-section; more details can be found in section III below. The typology of Rowe and Frewer is based on the key dimension of *'flow of information'* (information means knowledge and/or opinions) between '*public representatives*' (*i.e.* the public) and '*sponsor'* of the engagement mechanisms (*i.e.* ≈ public authorities). According to the '*flow of information*', three different descriptors differentiate initiatives which have been referred to as public participation in the past; these are: '*public communication'*, '*public consultation'*, and '*public participation'* (see figure 5 below).

Figure 5. Three classes of public engagement mechanism (Rowe G. and Frewer L.J. 2005, p. 255)



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For Rowe and Frewer, the aim of public engagement is to convey the maximum amount of relevant information (opinions and/or knowledge) from the maximum of relevant sources and to efficiently transfer them to the appropriate receivers. They implicitly suggest that optimising flow of information will increase the technical quality of the decision. In this perspective the three classes of public engagement mechanisms have the following competences/efficiency:

> "public communication: maximizing the relevant information flow from the sponsor and efficiently transferring it;
>
> public consultation: maximizing the relevant information flow from the maximum number of the relevant population and efficiently transferring it (with minimal information loss) to the sponsor, with the efficient processing of that information by receivers (the sponsor);
>
> public participation: maximizing the relevant information flow from the maximum number of all relevant sources and efficiently transferring it (with minimal information loss) to the other parties with the efficient processing of that information by the receivers (the sponsors and participants) and the combining of it into accurate composite."
>
> (Rowe G. and Frewer L.J. 2005, p. 263)

For a further differentiation between public engagement mechanisms, Rowe and Frewer have defined six *'significant variables'*[68] – that is, *'six significant charateristics'* – , still in the clear perspective of evaluating their appropriateness to transfer information between the parties involved. The public engagement mechanisms which have their significant variables (characteristics) in the same state, and thus having the same appropriateness to transfer information, are clustered in homogeneous categories. These six *'significant charateristics'* are: the method of selection of the participants, the presence or absence of a facilitator to elicit information, the mode of response of the participants, the flexibility of the input information by the sponsor, the medium of information between the involved parties, and the existence of structured rules for the aggregation of the collected information.

[68] Term coined by Rowe and Frewer.

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However, for the purpose of this research, this typology presents two limitations. First of all, as Bucchi and Neserini remarks (Bucchi M. and Neresini F., 2008), the most substantial shortcoming of the typology is that it is (implicitly) limited to the top-down mechanisms, that is, to the mechanisms actively promoted by a public institution. There is the need for an interpretative framework able to take into account also the bottom-up initiatives, which are the participatory forms commissioned by members of the public. Initiatives such as public protests, patient associations shaping the research and care agenda, or community-based research are deliberately not initiatives of public institutions.[69]

Second, the typology of Rowe and Frewer is static, that is, it does not take into account the chronological dimension of the decision-making processes in which the public may be involved; that entails two limitations. In the first place, the time when a public involvement initiative is set up is of significance. The impact of a public involvement initiative is different if it is organized at the outset, in the middle, or toward the end of a decision-making process. The key decisions are often made at the beginning of the decision-making processes while toward the end, only minor issues are still under discussion. Taking up again the model of flow of information, what is a 'relevant information' depends on the issue at stake, and thus on the stage in the decision-making process. Concerning the setting up of incineration plant, the issue at stake is not the same before and after the selection of incineration as waste treatment technology. Before the selection, all the technological solutions to waste treatment, such as mechanical biological sorting, methanisation, or thermolysis, are open. After the selection, however, only secondary aspects are open to debate, such as the capacity of the incineration plant, its location, or the type of furnace. Secondly, as Bucchi and Neresini note, over time, public engagement with regard to a certain issues may evolve: for instance, a public protest can induces a public authority to organise a consensus conference or a citizen panel or an initiative originally designed to produce a consensus may bring to light and radicalise conflictual positions (Bucchi M. and Neresini F., 2008).[70]

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[69] For further information about patient associations and community based researches, see: Callon M. and Rabeharisoa V., 1999; Epstein, Steven G, 1995a; Epstein, Steven, 1995b.

[70] The typology of Rowe and Frewer has a third limitation. Indeed, not only do public mechanisms, such as hybrid forums, involve the exchange of information, they are also processes during which new identities are negotiated and produced. The relevant groups do not always exist before a thorough interaction between them and the experts became possible; the relevant public may become visible and relevant only through an interactive process (Callon M., 1999). However this limit is not that important for the purposes of this research. However,

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II. Public Engagement Mechanisms: A Property Space

The property space of the public engagement mechanisms developed in this research attempts to overcome these shortcomings. The approach is to improve upon the typology of Rowe and Frewer, taking up again its key concepts: flow of information, public communication, public consultation, public participation, and also the six charateristics for the evaluation of the mechanisms.[71] In sub-section III.1, the typology of Rowe and Frewer is supplemented in order to take into account the bottom-up public involvement mechanisms, while sub-section III.2 supplements the key charateristics for the evaluation of the mechanisms, and sub-section III.3 explains how to take into account the point in time in which a public involvement initiative occurs.

II.1. Definition of Public Participation: Seven Concepts of "Engagement"

As I have already stated, the property space I develop here is based on the typology developed by Rowe and Frewer. Consequently, I take up most of the definitions they stated in their paper (Rowe G. and Frewer L.J. 2005). The first element to be taken into account is the party which commissions a public engagement initiative. Public engagement mechanisms can be divided into two families: the one sponsored by a public authority, the ***'top-down public engagement mechanisms'***, and the one sponsored by the public, the '***bottom-up public engagement mechanisms***'. In this research, the term ***'sponsor'*** refers to the party commissioning the engagement initiative. The term '***public authority'*** labels public institutions which carry out incineration plant projects or have monitoring competencies on the projects: municipalities, grouping of *communes*, *préfectures*, while the term ***'public'*** refers to as the part of the concerned public which is actually engaged (individuals, NGOs, formal/informal groups of interest). The ***'organizer'*** is taken as the party that conducts the engagement exercise, which may or may not be the same as the sponsor.

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once could add a seventh "significant characteristic" which vcould be labelled 'inclusion of new identities', with two values: enable, not enable.

[71] Bucchi and Neserini (Bucchi M. and Neresini F., 2008) adopt another strategy for overcoming the limitations of the typology of Rowe and Frewer. They built up a typology based on two dimensions: spontaneity and intensity. Spontaneity refers to the initiates of the production of scientific knowledge; a top-down mechanism is initiated by the public authorities while a spontaneous mechanism is initiated by the public. Intensity refers to the degree of participation of the public to the production of knowledge. These two dimensions are intented as a continuum and are represented by a qualitative two axis diagram. But this typology is not usable as such in this research. First, the concepts of intensity and spontaneity should be operationalised. As they are defined, they are too qualitative, and it is not possible to place the engagement intiative on the diagram in an objective way.

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In each top-down and bottom-up family, the three descriptive terms of communication, consultation, participation, make possible the differentiation between public engagement mechanisms. The differentiation relies on the '***flow of information***' between the '*public authority'* and the '*public'*. Moreover, it is necessary to enable the classification of the situations in which there is no involvement of the public, that is, when there is no flow of information between the '*public'* and the '*public authority'*. This situation is referred to as '***no public engagement***'. Thus what have been in the past called 'public participation' or 'public involvement' is composed of seven class: '*top-down public communication'*, '*top-down public consultation'*, '*top-down public participation'*, '*no public engagement*', '*bottom-up public consultation*', '*bottom-up public communication*' and '*bottom-up public participation*'. These seven concepts are defined below and represented in figure 6 below.[72] From here onward these seven concepts in combination are referred to as '***public engagement***'. The methods intended to enable this engagement are referred to as '***engagement mechanisms***' generically, and '***engagement initiatives or exercises***' specifically.[73] For example, a public meeting carried out on a given date, let's say on the 20 March 1999, is an exercise/initiative, while a public meeting, generally speaking, is a mechanism.

In *'**top-down public communication**'*, information is conveyed from the public authorities to the public (participants). The sponsor of the initiative is the public authority. Information flow is one-way: there is no involvement of the public as such, in the sense that public feedback is not required or specifically sought. When the public attempts to provide information, there is no mechanism specified *a priori* to deal with this at any level. During an initiative, a public authority may be represented by a (elected or non-elected) decision-maker or by an executive of the public administration.

In '***top-down public consultation****'*, information is conveyed from the public (participants) to the public authorities, following a process initiated by the public authorities. Significantly, no formal dialogue exists between the public and the public authorities. The information elicited from the public is believed to represent currently held opinions on the topic in question.

[72] The definitions of the three concepts '*top-down public communication'*, '*top-down public consultation'*, and '*top-down public participation'* are substantially identical to the definitions of ' *public communication'*, '*public consultation'*, and 'p*ublic participation'* developed by Rowe G. and Frewer L.J. 2005.
[73] Definitions adapted from Rowe G. and Frewer L.J. 2005, p. 254

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Figure 6. The seven types of public engagement[74]

Type of Public Engagement		Flow of Information		
Top-down engagement	Top-down Public Participation	Public Authorities	⟷	Public (participants)
	Top-down Public Consultation	Public Authorities	←	Public (participants)
	Top-down Public Communication	Public Authorities	→	Public (participants)
N. P.E.	No Public Engagement (N.P.E.)	Public Authorities	No Flow	Public
Bottom-up engagement	Bottom-up Public Consultation	Public Authorities (participants)	→	Public (representatives of the public)
	Bottom-up Public Communication	Public Authorities And/or Larger Public (participants)	←	(representatives of the public)
	Bottom-up Public Participation	Public Authorities (participants)	⟷	(representatives of the public)

In '***top-down public participation***', information is exchanged between the public (participants) and the public authorities. That is, there is some degree of dialogue in the process that takes place (usually in a group setting), which may involve representatives of both parties in different proportions (depending on the mechanism concerned) or indeed, only representatives of the public who receive information from the public authorities prior to responding. Rather than simple raw opinions being conveyed to the sponsors, the act of dialogue and negotiation serves to transform opinions in the members of both parties (public authorities and the public). This mechanism is sponsored by the public authority.

In *'**no public engagement**'*: there is no flow of information between the public and the public authorities. Policy makers, with the help of nominated experts, take decisions with no further reference to the public. The public but does not bring any kind of scientific-technical expertise or other kind of knowledge. Obviously, for this type, there is no engagement

[74] The figure is partly based on Rowe G. and Frewer L.J. 2005, p. 255

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initiative. Legal actions undertaken by the public or by the public authorities fall into the '*no public engagement*' class. In this case there is no direct flow of information between the parties: possible information are exchanged with the judge and not with the other party.

In '***bottom-up public communication***': information is conveyed from the public (representatives of the public) to the public authority and/or to a larger public (participants). It is a one way flow sponsored by the public. This act of informing has two scopes which do not exclude each other. When information is directly addressed to the public authority, the scope is to provide decision-makers with alternative information in order to influence their final decision. When information is addressed to a larger public, the scope is to provide this larger public with alternative information in order to gain its support, and thus to pressure the elected policy makers through public protests. In this second situation, alternative information may also reach some decision-makers.

In *'**bottom-up public consultation**'*, information is conveyed from public authorities (participants) to the public (representatives of the public); the representatives of the public search for more information. The information elicited from the public authorities represent currently held positions on the topic in question. Such engagement is similar to the top-down communication with regard to the flow of information and the way it is conveyed. However, '*Bottom-up public consultation*' must not be confused with the mechanisms initiated by the public authority who wish to answer to what they perceive as a public need (may be following public protests); these are top-down public communication. To be classified as a bottom-up public consultation mechanism, the delivering of information by the public authority information must be the consequence of a specific request made by some members of the public.

In '***bottom-up public participation***', information is exchanged between the public (representatives of the public) and the public authorities (participants). These mechanisms may be very similar to the top-down public participation ones; the difference relies in the sponsor, which is the public here. There is some degree of dialogue in the process that takes place (usually in a group setting), which may involve representatives of both parties in different proportions (depending on the mechanism concerned) or indeed, only representatives of the public who receive information from the public authorities prior to responding. Rather than simple, raw opinions being conveyed to the sponsors, the act of dialogue and negotiation serves to transform the opinions of the members of both parties (public authority and public participants).

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For reasons of clarity of the presentation of the seven concepts of engagement, I have employed the terms *'public'* and *'public authority'*. I remind the reader that the public is composed of the natural persons or legal entities concerned by the decision-making process (In this research, the public is the residents, the local NGOs, and the formal and informal groups of economic interest, and the public authority is the elected decision-makers of the grouping of *communes* in charge of the waste treatment, or the *Préfet*). However, in bottom-up engagement, not all of the public sponsor mechanisms, only some members of the public do. The members of the public who sponsor mechanisms are labelled by the term *'representatives of the public'*. This label, however, does not mean that these members of the public have a legitimate representativity of the overall public; there are some representatives, not the representatives'. Likewise, in top-down engagement, it is very unlikely that all the public participates to the mechanisms; the members of the public who takes part to the mechanisms are designated by the term *'participants'*. In fact, by *'participants'*, I mean the members of the public (in top-down mechanisms) or of the public authority (in bottom-up mechanisms) who take part in the mechanisms. This definition of *'participant'* is necessary for the following discussion concerning the eight significant characteristics of the mechanisms.

II.2. Eight Significant Characteristics of the Mechanisms

As we have just seen, the mains dimensions for the classification of public engagement mechanisms are a combination of the '*flow of information*' and of the sponsor of the mechanisms (public authorities or the public). As I have already stated in sub-section II.2. of this chapter, in order to assess the efficiency of public engagement mechanisms and to further differentiate the mechanisms, Rowe and Frewer have employed what they label "six significant mechanism variables" (Rowe G. and Frewer L.J. 2005), that is, six specific characteristics of the mechanisms.[75] These six specific characteristics are: participant selection method, facilitation of information elicitation, response mode, information input, medium of information, facilitation of aggregation. I take for this property the definition of the efficiency of public engagement mechanisms which consist in "*maximizing the relevant information (knowledge and/or opinions) from the maximum number of relevant sources and [in] transferring this efficiently to the appropriate receivers*" (Rowe G. and Frewer L.J.

[75] Since the labelling set up by Rowe and Frewer does not always speak for itself, I have changed some of the terms they coined. However, I specify when I have made this kind of changes.

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2005, p. 263). In other words, efficiency refers to appropriate ways of eliciting, transferring, and combining the public and the public authorities' views, that is, the aim is to maximize the flow of information. However, in order to assess the efficiency of the bottom-up engagement mechanisms, two charateristics must be added to the six developed by Rowe and Frewer; these are '*addressee of information*', and '*argumentation'*. The eight significant characteristics (the six set up by Rowe and Frewer and the two I have added) are discussed below with regard to the potential impact they have on the different components of the efficiency of the mechanisms in the flow of information model perspective. These components are maximizing the following: participants, information elicitation, information transfer, information processing, and information aggregation. The discussion is synthesised in table 2 below.

The mechanisms which have the *'same structural variability'*[76], that is which have their significant characteristics in the same state will be grouped together, and thus they will form a type of mechanisms. From here onward, the term *'class'* is referred to as the seven main categories of mechanisms defined in the previous sub-section, while the term *'type'* is referred to as the mechanisms which have their significant characteristics in the same state.

[76] Term coined by Rowe and Frewer (2005)

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Table 2. Summary of the eight key characteristics of the mechanisms (adapted from Rowe G. and Frewer L.J. 2005, p. 265)

Mechanism Charateristic[1]	Values of the Charateristic[2]	Aspect of effectiveness Potentially Influenced	Relevant Type of Engagement
Participant selection method*	Controlled Uncontrolled	Maximize relevant participants	Top-down/Bottom-up Communication Top-down/Bottom-up Consultation Top-down/Bottom-up Participation
Facilitation of information elicitation*	Yes No	Maximize relevant information from participants	Top-down/Bottom-up Consultation Top-down/Bottom-up Participation
Response mode*	Unlimited/open Limited/closed	Maximize relevant information from participants (members of the public ror the top-down engagements and public authority for the bottom-up ones)	Top-down/Bottom-up Consultation Top-down/Bottom-up Participation
Information input*	Set information Flexible information	Maximize relevant information from sponsor (public authority for the top-down engagements and members of the public for the bottom-up ones)	Top-down/Bottom-up Communication Top-down/Bottom-up Participation
Medium of information*	Face-to-face Non Face-to-face	Maximize transfer and processing of relevant information	Top-down/Bottom-up Communication Top-down/Bottom-up Consultation Top-down/Bottom-up Participation
Facilitation of aggregation*	Structured combination Unstructured combination	Aggregation of participant information	Top-down/Bottom-up Consultation Top-down/Bottom-up Participation
Argumentation**	Yes No	Maximize relevant information from public	Bottom-up Communication Bottom-up Participation
Addressee of information input**	Public authority Larger public	Maximize relevant participants	Bottom-up Communication Bottom-up Participation

The six charateristics marked "*" have been developed by Rowe and Frewer while I have added the two charateristics marked with "**".
[1] labelled "mechanism variable" by Rowe and Frewer.; labelled "levels of variable" by Rowe and Frewer

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Charateristics Associated With Maximizing Relevant Participants

The issue of maximizing relevant participants arises with respect to six types of mechanisms: top-down/bottom-up communication, consultation, and participation. A charateristic of significance for maximizing relevant participants is the *'participant selection method'*.[77] Mechanisms can be roughly divided into those that involve some degree of control of participant selection and those that have no control, relinquishing choice of involvement to the public participants themselves. In a controlled selection, the number and relevance of those engaged may be determined (by targeting communications or attempting to elicit information from a certain sample of population), whereas in an uncontrolled selection, this is not the case (the actively engaged individuals are likely to be the most numerous). Controlled selection may be more likely to maximize the relevant population involved than uncontrolled selection. Examples of controlled selection mechanisms are newsletters distributed in letterboxes, (top-down/bottom-up communication), opinion surveys (top-down consultation), or consensus conferences (top-down communication).

A particularity of bottom-up engagements, by comparison with those top-down, is that the public (representatives of the public) may convey information not only to public authority but also to a larger public. A relevant charateristic to enable the differentiation of the addresses of the information is the *'addressee of the input information'* who is either the public authority or the larger public.[78] With regard to the information flow model, information directly addressed to public authority (e.g. via a newsletter sent directly to decision-makers) is more likely to be efficient than information addressed to a larger public. In the latter forms, information may reach public authority largely distorted, or simply may not reach at all the public authority. However, in the approach of members of the public who sponsor these engagement mechanisms the scope is also (and often) to convince the public and thus to gain its support, in order to pressure public authority. In this perspective, it is more efficient to address information to a larger public.

[77] Key charateristic developed by Rowe and Frewer.
[78] Key charateristic created by the author.

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Charateristics Associated With Maximizing Relevant Information from Participants

Each active participant can be considered to possess a quantity of relevant information (knowledge or opinions) regarding the problem in hand as well as other information of no relevance. To be effective, an exercise must elicit all relevant information from each participant while not eliciting irrelevant or spurious information. Two charateristics are likely to affect the possibility of maximizing relevant information from participants; these are the presence of absence of adaptive *'facilitation of information elicitation'*, and the *'mode response'* available. These two charateristics are valid for top-down and bottom-up consultation, and top-down and bottom-up participation. There are valid for the communication mechanisms. These two charateristics have been developed by Rowe and Frewer.

The *'facilitation of information elicitation'* consists of the presence of a facilitator, named at the outset of the initiative, and who manages the elicitation process and search for gaining input from all participants. Active facilitation increases the elicitation of information through the stimulation of each participant to give her/his opinion. Furthermore in meetings (consultation or participation) the facilitator is more likely to gather all relevant information because he concentrates on this only task only and is not involved, as such, in the discussions. (In a sense, not only does a facilitator maximize relevant information from participants, but also plays a role in maximizing participants numbers through ensuring that all participants are active). An example is the *commissaire enquêteurs* who act in the framework of the *enquêtes publiques* (public enquiries). They are in charge of gathering opinions, suggestions, and counter proposals from the public through individual interviews and registers, and then of aggregating them. If the presence of a facilitator is a key charateristic, the quality of the elicitation may also significantly influence the gathering of relevant information.

The *'mode of response'* is either "open" or "closed". Mechanisms that only allow respondents to choose among one or more options (opinion survey requiring ratings on a scale) are "closed", whereas those that allow free responses (e.g. enquiry registers) are "open". The open responses are more liable to affect the likelihood of maximizing relevant information than the closed ones; although, they are likely to elicit also more irrelevant information. Concerning the loss of information in the closed responses, the yes-no answer of a referendum is the most striking example.

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In summary, active participants only represent potential information sources: they need to be engaged in such a way that comprehensive and appropriate information is elicited from them.

Charateristics Associated With Maximizing Relevant Information from Sponsor

Information sources may include the public authority and its experts, as well as members of the public (and eventually their experts). Indeed in the information flow model, it is just as important that information from the public and from the public authority is full and relevant.

Top-down/bottom-up communication and participation engagements can be differentiated with regard to the '***information input***' (*i.e.* information delivered by the sponsor): there are the mechanisms with set information input, and those with flexible input.[79] Examples of information set prior to the initiative are newsletters, non-interactive web sites, exhibitions (top-down/bottom-up communication) or *enquêtes publiques* for which information documents are available in town halls (this an top-down participation. Members of the public have the possibility to write down their opinions, suggestions or counter-proposals on a register or to orally convey them through an individual meeting with a facilitator). Examples of the flexible type include meetings during which the sponsor can adjust the information delivered according to the questions asked by the participants (communication). Most of top-down and bottom-up participation mechanisms allow flexible information input in order to facilitate dialogue between the parties involved. It is reasonable to hypothesise that flexible input is more liable to maximize relevant sponsor information than set input, all other charateristics being equal.

In top-down and bottom-up mechanisms, the roles of public authority and of the public with regard to the emission and reception of information are inverted: while in top-down mechanisms, information input are provided by public authority (the sponsor) and responses by the public (in fact the participants), in those bottom-up information input are provided by the public (the members of the public who sponsor public engagement initiatives) and responses by public authority (the participants).

[79] key charateristic developed by Rowe and Frewer.

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The public does not always provide a large amount of information. Bottom-up communication and participation engagements can be classified with regard to the presence of '***argumentation***' in the input information.[80] Two cases are possible, either substantial argumentation is conveyed, or not. In the mechanisms where there is no substantial argument, information mainly consists in showing support or opposition to the positions held by public authority. This is the case of the traditional protests exercises (e.g. demonstration, petition). On the contrary, in bottom-up communication initiatives, such as newsletters or association public meetings, the members of the public who sponsor these mechanisms develop arguments supporting their position. Through protest mechanisms, the members of the public who sponsor the mechanism do not rely that much on the transformation of the position of public authority due to alternative information, as on the demonstration of an extended public opposition. The aim of public protests is thus to pressure public authority. In the meantime, the sponsor(s) of a protest may gain in credibility with regard to their representative ness of the position held by the larger public. The more the public participate to a protest, the more its sponsor gains representative ness in the eyes of the public authority. Consequently, in case of success of public protests, their sponsors can claim more easily a privileged role as participant in the possible following top-down public participation or consultation mechanisms.

Charateristic Associated with Maximizing the Effective Transfer of Information to, and its Processing by, Recipients.

In the perspective of the information flow model, one aim of engagements is to maximize the transfer of information between the parties involved, and to ensure that the recipients (be these the sponsors or the participants) fully understand these information. In this respect, a significant charateristic is the ***'medium of transfer of information'***.[81] Information can be conveyed either face-to-face, through initiatives such as public meetings (communication) or individual meetings with a *commissaire enquêteur* (public enquiries), or non face-to-face using phones or computer technology (teleconferencing, comments of web site information through e-mail). Because of the loss of visual and non-verbal cue when there is no physical contact, non face-to-face mechanisms are less likely to diminish loss or misunderstanding of information.

[80] Key characteristic added by the author.
[81] Key characteristic developed by Rowe and Frewer.

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Furthermore, non face-to-face mechanisms using certain 'technologies' may condition the number of respondents in top-down consultation or participation. For example, some forms of media, in particular the internet, may disenfranchise those who do not posses, or are not very familiar with, them.

Charateristics Associated With Maximising the Aggregation of Relevant Information from Participants

In top-down/bottom-up participation exercises and top-down consultation exercises, the problem arises as to how merge the various knowledge and opinions of the various participants into a response which accurately combines all relevant information from participants. An inefficient aggregation can severely harm the effectiveness of an exercise, even if all relevant information from all participants has been correctly elicited and transferred. A significant charateristic aimed at taking into account this aspect is the '***facilitation of the aggregation process***' which consists in the presence or absence of prior established structured rules for the aggregation of information.[82] Structured processes are more liable to affect the likelihood of aggregating information in such a manner to produce a faithful image of the various individual information. The aggregation is a synthesis that must allow retrieval of the various opinions and point of views. The aim is not to provide a coherent whole; the final report must take into account possible dissensions within the public or contradictory points of view. Unstructured processes without the observance of clear outset rules, equity and input from all participants is not guaranteed. This charateristic bears some similarities with the facilitation of information elicitation, in the sense that it maximizes the effective transfer of information from all participants. However, it is possible to have a structured process of information treatment without a designated facilitator. Opinion surveys or referenda are the typical examples of a structured aggregation of information which accurately takes into account the opinion of each single participant.

II.3. Along The Decision-Making Processes: Three Key Chronological Stages

In order to enable a chronological analysis of the evolution of the use of public engagement mechanisms, it is necessary to provide a chronological model common to the

[82] Key characteristic developed by Rowe and Frewer.

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selected decision-making processes. Since the key dimension of the mechanisms typology is the '*flow of information*', it is reasonable to base the definition of the stages on 'what the information is about', or in other words, "what are the importance the issues at stake?" Indeed, the issues at stakes are not the same at the outset and at the end of the decision-making process. At the outset, all the options are open, or the range of options may be broadened, whereas towards the end, only minor characteristics of an already defined project may be under discussion. In other words, along the decision-making processes, the '*freedom of manoeuvre*' (*i.e.* the importance of the issues at stake which are under discussion) continuously diminishes. This point is important concerning public engagement, and more particularly public participation: a given mechanism has not the same impact on the outcome of a decision-making process whether it is organise at the beginning, when all options are open, or toward the end of a decision-making process.

Consequently, following this concept of importance of the issues at stakes, I divide the decision-making processes into four sequential stages. These are *'framing'*, *'specifications'*, *'realisation'*, and *'running'* (see figure 7 below). As its labelling indicates, during the '***framing***' stage, the 'problem' is framed. That is, either it is decided what the problem is about, or a key issue is decided. Because virtually all options are open, this stage can be qualified as a 'divergent phase'. Concerning, for example, GM crops, the framing consists of deciding what the problem is about: long-term health effects for anyone eating them, environmental safety, labelling and consumer choice, intellectual property rights, ethics, food security, poverty reduction, environmental conservation, and potential disruption or even possible destruction of the food chain. In this research the '*framing'* stage consists of deciding a key issue: the selection of a waste treatment technique among incineration, and other techniques such as methanisation, or technical-biological sorting.

The second stage is the '***specifications****'* stage: after the problem has been framed, this stage consists of defining the solutions to the problem. For example, concerning the environmental safety of GM crops, a part of the solution could be the experimental cultivation of a few plots of land to study the impact on the environment. During the *'specifications'* stage, issues such as the number of plots, their location, or the type of GM crops to be cultivated would be decided. In this research, the issues at stake are the specifications of the selected technique (i.e. incineration in this research). The decision-makers have to decide about the technical specifications of the incineration plant, (such as its capacity, the technology for the furnaces, or the type of filters), its location, and the specificities of the terms and conditions of its running by a private operator.

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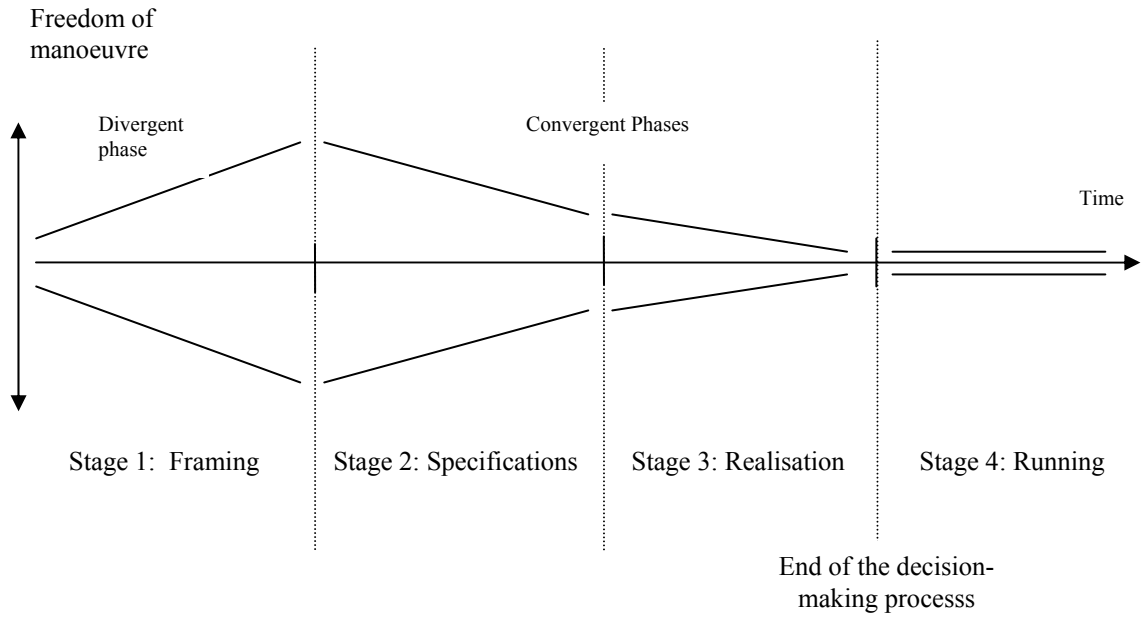
Figure 7: Stages of Decision-Making Processes



The *'**realisation**'* stage consists of the implementation of the solutions decided during the second stage. When this stage arrives, there is little to be debated. Continuing with the GM crops example, during this stage, a few plots of land are cultivated. In this research, the realisation consists of the building of the incineration plant, and only minor changes to the technical specifications can be made. Typically, the residents ask for extra monitoring systems of the emission of pollutants (e.g. setting up of continuous or semi-continuous measurements of dioxins at the mouth of the chimney).

Once the facility is '***running***', the solutions have been fully implemented and virtually no modification can be realised. Concerning incineration plants, only information about the functioning of the incineration plant may be provided to the residents. In the framework of the Local Commission for Information and Monitoring, the operator and the grouping of *communes* are legally obliged to communicate information about the emissions of pollutants to the local environmental NGOs.

In brief, the more the decision-making process is advanced, the less numerous and important the issues are likely to be under discussion While the first stage is 'divergent', the three following stages constitute the 'convergent phase'. The more the process is ahead, the

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less there are issues to be decided. In principle, at any stage the decision-makers can decide to restart the decision-making process, for example because of a strong public opposition. As I have already stated in chapter 2, in this research the end of a decision-making process is defined by the opening of the incineration plant or by the abandonment of the incineration plant project. Consequently, I focus either on the three first stages, or until the stage during which the incineration plant project is abandoned. I do not study the 'new' decision-making processes which starts after the abandonment of the initial incineration plant project.

This four-stage model fits particularly well decision-making processes in which the aim is to build infrastructures, such as incineration plants, nuclear waste site, railway lines, etc. Concerning decisions for which there is no building of infrastructure the stages may be different. However, it is still possible to define stages according to the number and/or importance of the issues at stake.

III. Degrees of Controversy: A Property Space

In this section, I develop a property space which makes possible the classification of the decision-making processes according to their degree of controversy. This property space derives from the property space developed in the previous section.

III.1. Four key variables

In this research, I define the degree of controversy through the activity of the NGOs. The activity of the NGOs makes possible the drawing of a good picture of the discontent of the residents. In substance, the more the NGOs are active, the more a decision-making process is controversial. Let's note that dissensions within public authorities have not been taken into account to assess the degree of controversy. The degree of controversy of a decision-making process can thus be measured through the quantity (i.e. the number) and quality (i.e.the types) of bottom-up public initiatives, and through the type of NGOs ('*ad-hoc'/'existing'*) engaged. In concrete terms, the degree of controversy of the decision-making processes can be measured through the combination of a series of variables. These variables must reflect the determination of the NGOs on one hand, and the support of a substantial number of residents on the other hand. The combination of the four following variables matches these requirements: the '*ad hoc NGO*' (presence/absence), the '*legal actions*' (presence absence), the '*bottom-up communication initiatives*' (number), and the '*public protest initiatives*' (number).

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As I have stated in chapter 3, the NGOs which engaged the issue can be divided into two types, the '*existing'*, which are environmentally oriented, and the '*ad hoc*', which are waste oriented; the '*ad hoc'* NGOs were especially created on the occasion of the incineration plant project. The presence of an '*ad hoc*' NGO shows *a priori* the determination of a group of residents to fight against the incineration plant project, and consequently the decision-making process is likely to be controversial.[83] However, it is necessary to control whether this determination is transformed into facts by the NGOs. Moreover, it is possible to have a high level of contestation organised by the '*existing*' and not by the '*ad hoc*' NGOs. Thus, in order to measure the degree of controversy it is necessary to count the initiatives sponsored by the engaged NGOs (so here we count the actions of both *existing* and *ad hoc* NGOs).

A type of initiative which shows the determination of the NGOs is the '*legal action*'. '*Legal actions*' are a good indicator of a high degree of controversy: dialogue between the NGOs and the public authority is broken off; there is no flow of information between the public authorities and the NGOs (see sub-section III.1 of this chapter for more details concerning *'legal actions'*). However, legal actions do not give evidence that a substantial number of residents stand against the incineration plant project since a legal action can be undertaken by a single resolute individual. Furthermore, the absence of legal action does not indicate, by itself, that the decision-making process is not controversial at all. So, the '*legal actions*' variable alone is not sufficient to evaluate the degree of controversy, and it is necessary to combine it with other variables. More precisely, it is necessary to look at initiatives which the realisation needs the support of a group of persons: the '*bottom-up communication initiatives*' fulfil this criterion.

The '*number of bottom-up communication initiatives'* reflects the quantity of the actions undertaken by the NGOs.[84] The higher this number, the more the associations are active, so the more the decision-making process is controversial. The organisation of numerous

[83] The number of the engaged '*ad hoc*' NGOs is not important since diverse strategies can be enacted: the fusion of existing NGOs and of individuals in one association (such as Collectif Incinerà'tort in the case of Angers), or the actions in parallel of specialised NGOs (such as in the case of Vaux-le-Pénil with a record number of 5 NGOs engaged). In both cases, a lot of residents were engaged; the only difference was the type of organisation. By the way, the absence of any NGO ('*ad hoc'* and 'existing') would indicate, for sure, a non-controversial decision-making process.

[84] Among the three types of bottom-up public engagement mechanisms (communication, consultation, participation), the number of communication initiatives is the best indicator of the public activities. Indeed, the mechanisms of this class are, by far, the most used. Bottom-up consultation is not used that much, and bottom-up participation is not used at all.

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initiatives such as public meetings or newsletters requires a great amount of work which can be produced only by a substantial group of coordinated and determined persons. This variable is an indicator of the number of people who are engaged. In other words, the number of '*bottom-up communication initiatives*' is an indicator of the number people who support the opposition to the incineration plant.[85] The '*number of bottom-up communication initiatives*' is, however, a quantitative indicator. From a qualitative point of view, one may argue that these initiatives may not be to stand against the incineration plant project. In order to overcome this criticism, I resort to a type of mechanisms which are definitely used to show discontent: public protests.

'*Public protests*' are a type of '*bottom-up communication mechanism*' that demonstrate the discontent of the NGOs. The more NGOs organise public protest initiatives, the more the NGOs are opposed to the incineration plant project, and the more the decision-making process is controversial. However, a high number of public protests reflects only punctual strong actions; that is why I combine it with the bottom-up communication initiatives. This is another reason why it is necessary to resort to a combination of variables, and that a variable alone can not measure the degree of controversy of a decision-making process.[86]

In order to actually enable the classifications of the decision-making processes according to their degree of controversy, the state of each of the four variables has been qualified as 'high' or 'low': the 'high' state gives evidence in favour of a controversial situation, whereas 'low' is in favour of a non controversial situation. These variables are summarised in table 3 below. For the first variable '*presence/absence of an ad hoc NGO*', the state high is for the presence of '*ad hoc*' waste oriented' NGOs while low is for the absence of such NGO.

[85] I remind that in chapter 3 I have discussed the fact that in this research I have assimilated the public to the NGOs. In substance, I have claimed that it is unlikely that individuals organise initiatives to oppose the incineration plant projects; and in the facts the engaged residents created or joined formal or informal groups. I designate both formal and informal groups with the same term 'NGO'. I recognise that a more reliable indicator the number of individuals who actively supported the opposition to the incineration plant would be the number of the members of the NGOs, or the number of persons who wrote some comments during the public enquiry (however this last indicator would be available only in the decision-making processes which reach the stage of the public enquiry, which takes place toward the end of decision-making processes). But, put simply, although I have not gathered this type of data, I have adapted the theoretical framework to the data in my possession.

[86] It is not necessary to look at the other types of bottom communication initiatives. They would not provide further information about the degree of controversy because the number of bottom-up communication initiatves is equal to the sum of the public protests and of the other types of communication initiatives.

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The presence of '*legal actions*' undertaken by the NGOs indicates a controversial situation. So this presence corresponds to the state high of the variable, whereas the low state is for the absence of legal action.

Table 3. Summary of the four variables influencing the degree of controversy

Variables	Levels	Correlation with the Degree of Controversy
Type of NGO	Low: Absence of '*ad hoc*' NGO (0) High: presence of an '*ad hoc*' NGO (X)	The presence of especially created NGOs indicates a higher level of controversy than the presence of existing NGOs. The total absence of NGO indicates a non controversial situation. To then facilitate the categorisation of the decision-making processes, the presence of especially created NGOs is considered as the state 'high' of the variable whereas the absence is the state 'low'.
Bottom-up Communication	Low: $0 \leq Ni < A$ High: $A \leq Ni$ Ni: Number of initiatives A: Average of initiatives in the ten cases	The higher is the number of bottom-up communication initiatives, the higher is the degree of controversy
Public Protests	Low ($0 \leq Ni' < A'$) High ($A' \geq Ni'$) Ni': Number of initiatives A': Average of initiatives in the ten cases	The higher is the number of public protests, the higher is the degree of controversy
Legal Actions	Low: Absent (0) High: Present (X)	The presence of legal actions indicates a higher degree of controversy. And thus this corresponds to the state 'high' of the variable, whereas the absence is the state 'low'.

A reasonable definition of the high/low state of the *'bottom-up communication initiatives'* variable is to compare the number of bottom-up communication initiatives (Ni) with its mean in the cases studied (A). Thus, two states are possible: below the mean, 'Low' ($0 \leq Ni < A$); and above the average, 'High' ($A \leq Ni$).

Concerning *'public protests'*, here also, it is reasonable to define two states of the variable depending whether the number of initiatives for a determined case (Ni') is below or above the mean of the initiatives of all the studied cases (A'): below the mean, 'Low' ($0 \leq Ni' < A'$); above the mean, 'High' ($A' \geq Ni'$).

The definition of the states high/low based on a reference to the arithmetic mean can work only if the standard deviation is high, that is, if the dispersion of the collection of numbers is

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important.[87]

III.2. The Property Space

Table 3 may now be used to define the classes of controversy. To be systematic, the typology must take into account all the combination of the states of the four variables. In substance, the more numerous are the variables in a 'high' state, the more the decision-making process is controversial. However, I have not assigned the same weight to the four variables. The variable *'legal action'* has more weight than the three others because its presence surely indicates the presence of determined individuals. That does not mean that the absence of *'legal actions'* is synonymous of non-controversial decision-making process: the state of the three other variables (presence of ad hoc waste oriented NGOs, level of bottom-up communication, level of public protests) must be also taken into account to accurately evaluate the degree of controversy. The same weight has been attributed to the three other variables. Thus, two groups of combinations can be identified: with legal action, and without legal action. Then, in each groups four combinations are possible: from zero to three of the other variables are in a 'high' state (implicitly from three to zero variables in a low state). So, the eight combinations are:

Legal action, 3 variables high (0 low)	No legal action, 3 variables high (0 low)
Legal action, 2 variables high (1 low)	No legal action, 2 variables high (1 low)
Legal action, 1 variable high (2 low)	No legal action, 1 variable high (2 low)
Legal action, 0 variable high (3 low)	No legal action, 0 variable high (3 low)

A ninth combination, which shows a non controversial decision-making process, must be added; this is: no legal action, 0 variable high with the particularity that the number of bottom-up communication initiatives and the number of public protest are equal to zero.

However, for the purpose of this research, there is no need for nine degrees; five are sufficient to describe the various levels of controversy. Table 4 below identifies these five

[87] The standard deviation is a measure of the dispersion of a collection of numbers. The standard deviation remains the most common measure of statistical dispersion, measuring how widely spread the values in a data set are. If many data points are close to the mean, then the standard deviation is small; if many data points are far from the mean, then the standard deviation is large. If all data values are equal, then the standard deviation is zero.

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degrees; from the less to the more controversial, these are: *'Non Controversial'*, *'Slightly Controversial'*, *'Moderately Controversial'*, and *'Highly Controversial'*. This reduction from nine combinations to five degrees is possible considering that two different combinations can describe a same degree of controversy. This is due to the fact that the variable *'legal action'* has more weight than the others.

A decision-making process can be of a '**Highly Controversial**' type whether one or more legal actions were undertaken, and at least two of the three other variables (type of NGO, bottom-up communication, public protest) are in the 'high' state, or whether no legal action was undertaken but the three other variables are in their 'high' state. The other classes of controversy are defined decreasing the number of the variables in a 'high' state by one for each lower degree.

The ***'moderately controversial'*** type groups together two combinations. The first one is the presence of a legal action and only one of the three other variables in the state 'high'.

Table 4. Property spaces of the decision-making processes according to their degree of controversy

Classes of Controversy		States of the Significant Variables	
Mainly Controversial	**Highly Controversial**	– Legal Action – Two or three out of the three other variables (*ad hoc* NGO, Bottom-up Communication, Public Protests) are in a 'high' state	Or – No Legal Action – All the three other variables (*ad hoc* NGO, Bottom-up Communication, and Public Protests) are in a 'high' state
	Moderately Controversial	– Legal Action – One out of the three other variables (*ad hoc* NGO, Bottom-up Communication, and Public Protests) is in a 'high' state	Or – No Legal Action – Two out of the three other variables (*ad hoc* NGO, Bottom-up Communication, or Public Protests) are in a 'high' state
Mainly Non Controversial	**Slightly Controversial**	– Legal Action – None of the three other variables is in a 'high' state	Or – No Legal Action – One of the three other variables (*ad hoc* NGO, Bottom-up Communication, or Public Protests) is in a 'high' state.
	Almost not controversial	– No Legal Action – The three other variables are in a 'low' state, but the number of bottom-up communication initiatives and the number of public protests are not both be equal to zero, (See the non controversial type)	
	Non controversial	– No legal action – No *ad hoc* NGO – No bottom-up communication at all – No public protest at all	

The ***'slightly controversial'*** decision-making processes are characterised either by the presence of a legal action and none of the three other variables in a 'high' state, or by the absence of a legal action and one of the three other variables in a high state, no legal action was undertaken and one or two of the other three variables are in a 'high' state.

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As for the *'almost controversial'* decision-making processes, they are defined only by one combination which is the absence of legal action and the 'low' state of all the other variables. However, the three variables (*ad hoc* NGO, bottom-up communication, and public protests) are not equal to 'zero' in the same time. Indeed, this combination (i.e. absence of *ad hoc* NGO, low bottom-up communication, low public protest, and absence of legal action) defines the 'non-controversial' decision-making processes.

At last, to simplify, these five categories can summarized into twp main classes: the '*quite controversial*' decision-making processes, which groups together the highly and moderately controversial decision-making processes, and the '*quite non-controversial*', which groups together the slightly, almost not, and non controversial decision-making processes.

To finish, the qualifications *'moderately'*, *'slightly'*, or *'almost not'* does not mean that certain individuals were not strongly determined but that they were not that numerous.

IV. Methodology

IV.1. Data collection methods: Two semi-structured questionnaires

The data used to answer the first three research questions have been collected through semi-structured interviews. I have set up two different 'interview tools' to carry out these interviews: one for the public authorities, and the other for the NGOs. To begin with, the public authorities have been interviewed with the help of a 'chronological table of the decision-making processes' (see the appendix "Chronological Table" to find the template). For each decision-making process, three categories of data have been gathered. The first category, the dates of the key events, makes possible a precise timing of each decision-making process structure. The second category consists of the (top-down) initiatives that the public authority sponsored to inform or involve the public; the number of initiatives and the point in time they took place have been gathered too. In the third category the initiatives that the public and more precisely the NGOs sponsored, including the number of initiatives and the point in time they took place, are listed. The two last categories of the data collected enable the measurement of the top-down and bottom-up public engagement in the decision-making processes. For each category of data, a series of possible answers based on the initial explorative open interviews[88] was proposed. Concerning the key events, possible answers are, for example, the creation of grouping of *communes* put in charge of the waste treatment, or

[88] See chapter 2, sub-section III.2

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the carrying out of the public enquiry. Concerning top-down public engagement, possible answers are the most usual mechanisms such as newsletters, or public meetings. At last, with regard to bottom-up engagement, possible answers are also the most usual mechanisms such as petitions, protests, or newsletters (the list of the possible answers I proposed can be found in the appendix "Chronological Table").The temporal resolution of the chronological tables is the month; however not all the interviewees were able to be so precise, above all concerning the oldest events which took place almost ten years ago, and sometimes the actual precision is the quarter or the semester. But finally, this lack of precision has not impacted the data analysis since I have divided the decision-making processes into three key chronological stages, each stage lasting from a few months (8 months) to a few years (6 years), according to the stage and to the decision-making process.[89]

As to the interviews with the NGOs, they were realised with the help of a semi open questionnaire made of two questions. The semi-structured questionnaire can be found in the appendix entitled "questionnaire for the NGOs", the questions relevant for this part of the research are the questions number 5 and 8. Question number 8 was about the initiatives they undertook, including their number, and the point in time they took place. The aim of question number 5 was to cross-check the declaration made by the public authority concerning the top-down public mechanisms: I asked the NGOs the mechanisms through which the public authority engaged them.

Finally, as far as possible the information delivered by the public authorities and the NGOs have been cross-checked through the documentation these actors published: minutes of meetings, newsletters, and web sites (see the appendix "Sources of data" to find the exhaustive list of the interviewed carried out, and of the documents gathered).

IV.2. Data analysis methods

To answer the first research question "to what extent is the public actually involved in decision-making processes?", I draw graphs which make possible the analysis of the evolution of the public engagement along the decision-making processes: the three key chronological stages are in abscissa and the number of initiatives for each class of mechanisms are in ordinate. Two series of charts have been drawn: a series 'by decision-making process', and a

[89] The exact duration of each stage, including the dates, can be found in the tables in the appendix "Actual Public Engagement: Charts by Decision-Making Process".

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series 'by class of mechanisms'. In the series by decision-making processes, there are ten charts, one per decision-making process. On each chart, there are seven graphs: one for each class of public engagement mechanisms (see the charts in the appendix "Charts by Decision-Making Process"). This series enables me to assess the extent to which the ten grouping of *communes* on one hand, and the NGOs on the other hand, resorted to each class of mechanisms, and at which point in time. In the series by class of mechanisms, there are seven charts, one per class of mechanisms (see the charts in the appendix "Charts by Class of Mechanisms"). On each chart, there are ten graphs, one per decision-making process. This series makes possible the comparison between the decision-making processes for a given class of mechanisms.

To answer the second research question "how strong is the political will to involve the public?", the actual public engagement is compared with the legal provisions which frames the public involvement in France. If the local decision-makers go beyond the compulsory norms, there is a strong political will to involve the public. On the contrary, if they limit the public involvement to the minimum imposed by the law (this minimum being very low), there is little political will to involve the public.

To answer to the third research question "what is the impact of the public engagement on the decision-making processes (i.e. on their degree of controversy, and on their outcome)?", in each decision-making process the actual public engagement is confronted with the outcome of the decision-making process (abandonment/opening of the incineration plant) on one hand, and with the degree of controversy of each decision-making process on the other hand. The outcome of the decision-making processes is confronted with the actual top-down on one hand, and actual bottom-up engagement on the other hand.

More details about the data analysis method can be found in chapter 6, in the sections in which I attempt to answer to the three research questions, respectively.

V.Summary-Conclusion

In this chapter, I have provided two property spaces. The first property space enables a classification and an evaluation of all the types of '*public engagement mechanisms*' according to their appropriateness to convey information between the public and the public authorities. This property space is based on, but overcomes the shortcomings of, the typology developed by Rowe and Frewer (Rowe G. and Frewer L.J. 2005). That is, the property space takes into account bottom-up mechanisms, and not only top-down ones, and it also enables the

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classification of the legal actions undertaken either by the public or by the public authorities. Public engagement mechanisms are classified according to the sponsor of the mechanisms (the public authority: top-down, or the public: bottom-up), and above all according to the '*flow of information*' between the public and the public authority (communication, consultation, participation, and no flow). Seven classes of mechanisms have thus been developed: '*top-down communication*', '*top-down consultation*', '*top-down participation*'; '*no public engagement*' (no mechanisms and/or legal actions); '*bottom-up communication*', '*bottom-up consultation*', and '*bottom-up participation*'. Furthermore, in contrast to the typology of Rowe and Frewer, the property space takes into account the chronological dimension of the public engagement through the definition of three key chronological stages. These chronological stages have been defined according to the importance of the issues under discussion. These stages are: '*framing'*, '*specifications'*, and '*realisation'*. Finally, to evaluate the efficiency of the bottom-up mechanisms (*i.e.* maximizing the flow of relevant information between the maximum members of the public and the public authority), I have added two charateristics to the six defined by Rowe and Frewer: '*Participant selection method'*, 'Facilitation of information elicitation'*, 'Response mode'*, 'Information input'*, 'Medium of information'*, 'Facilitation of aggregation'*, 'Argumentation'**, 'Addressee of information input'***.[90] These eight charateristics enable the clustering of similar mechanisms: the mechanisms which have the same significant charateristics are grouped together, and thus make a type. I show that the evaluation of the efficiency of the mechanisms is not central in this research: in fact, I do not use it in the analysis of the data (see chapter 7). I have kept this part of the theoretical framework in order to make a more complex discourse concerning public engagement mechanisms and their role in the decision-making processes.

In this definition, using seven concepts of public engagements, the final decision remains in the hands of the decision-makers (excepted for referenda); it is not the hands of the public. There is thus no empowerment of the public in the sense of Arnstein (see sub-section II.1 of this chapter for further details).

Let us note here that this property space make no assumption concerning the motivations of the local decision-makers for sponsoring public engagement mechanisms. The elected decision-makers may resort to public engagement just to get rid of social movements, giving

[90] * key charateristics developed by Rowe and Frewer
** key charateristics developed by the author

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the illusion of an engagement of the public. This research does not aim at assessing the sincerity of the top-down engagement mechanisms.

The second property space I have developed in this chapter enables the classification of decision-making processes according to their degree of controversy. This property space is innovative. The key point concerning this property space is that it is based on the activity of the NGOs: the more the local NGOs sponsor initiatives to stand against the incineration plant project, the more the decision-making process is controversial. The variables which enable the differentiation between the degrees of controversy must reflect the determination of the NGOs, and the support of a significant part of the residents. These variables are: '*type of NGO*' (presence/absence of an ad hoc NGO), '*legal actions*' (presence/absence), '*bottom-up mechanisms*' (number), and '*public protests*' (number).

The combinations of these four variables define five degrees of controversy: *'highly controversial'*, *'moderately'*, *'slightly'*, *'almost not'*, and *'non controversial'*. Then, in order to facilitate the analysis of the empirical data, I have also defined two main categories: the *'mainly controversial'* decision-making processes, which groups together 'highly' and *'moderately'* controversial decision-making process; and the *'rather non-controversial'*, which groups together *'slightly'*, *'almost not'*, and *'non-controversial'* decision-making processes.

This property space is an attempt to make a grounded and objective measurement of the degree of controversy of the decision-making processes. It has been designed especially for the decision-making processes studied in this research. One may use this property space as such for future researches, however, it can be used as a basis for the development of new property spaces, more adapted to new situations. The presence of public protest and legal actions are an indisputable sign of a controversial decision-making process. The counting of the number of bottom-up communication initiatives and public protests provide, on the other hand, a relative measurement of the degree of controversy.

Finally, the data are collected through two semi-structured questionnaires: one for the public authorities, and another one for the NGOs. The data analysis method is a mix between qualitative and quantitative methods. The details of the data analysis method can be found in chapter 6, in the sections in which I attempt to answer to the three research questions, respectively.

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Chapter 5
Public Engagement: Legal Framework

This chapter describes the provisions for public engagement in the decision-making processes surrounding the setting up of incineration plants in France. All the public engagement mechanisms provided by the law are identified, differentiating those which are peremptory (*i.e.* compulsory) from those discretionary (*i.e.* non compulsory). By 'peremptory' I make reference to the mechanisms that the public authority has to sponsor to engage the public. By 'discretionary', I designate the mechanisms which are provided by the law, but that the local public authorities have the liberty to implement or not.

The decision-making processes for the setting-up of an incineration plant are ruled by a series of environmental, urban, and administrative acts which are respectively gathered together in the *Code de l'Environnement*, *Code de l'Urbanisme*, and *Code Général des Collectivités Territoriales*. The *Commision Nationale de Débat Public* (National Public Debate Commision) does not apply to this research.[91]

The legal framework that is drawn up here is valid for the years 1992-2005, which corresponds to the period of the ten decision-making processes.[92] During this period, the legislation has evolved. Changes in the norms which are subsequent to the cases studied in this research must not be taken into account because under the terms of article 2 of the *Code Civil* "Legislation provides only for the future; it has no retrospective operation". Moreover,

[91] See section IV of this chapter for further explanations about the National Public Debate Commission
[92] See appendix "the ten decicision-making processes" for further details about the ten decision-making processes

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under the terms of article 1 of the *Code Civil* "Statutes and, when they are published in the *Journal Officiel de la République Française*, administrative acts shall come into force on the date specified in them or, in the absence thereof, on the day after their publication". The changes which occurred between 1992 and 2005 are notified, and the dates when these norms came into force are specified. [93]

This chapter is structured around the four types of provisions which order the public engagement in the decision-making process. The first section deals with the 'peremptory provisions' which order public engagement in the decision making process itself, and which establish the obligations of the local decision-makers. The second section lists the 'discretionary provisions', that is, the provisions which provide the grouping of *communes* with extra public engagement mechanisms; the grouping of *communes* having the freedom to implement or not these mechanisms. The third section brings together the 'provisions in case of existing facilities or services:' these are provisions that are not directly linked to a decision-making process, but which provide the local public life with places where local decision-makers and the public can meet. The last section is dedicated to the National Commission of Public Debate and to the Aarhus convention. Even if these norms actually have no impact on the legal framework of the cases studied in this research, it is important to know what they consist of since they are indicative of the current legislative trend toward more public participation.

I. Peremptory Provisions

With regard to the provisions ruling the public engagement in the decision-making processes for the setting up of incineration plants, the decision-making process can be divided into three periods: before the public inquiry (*enquête publique*), during the public inquiry, and after the opening of the incineration plant. In our model of the decision-making processes

[93] In France, the normative texts concerning a given subject are gathered together into *Codes*. Among others, there are the environmental *Code*, the civil *Code*, or the penal *Code*. However, the *Codes* regularly evolved in order to take into consideration the new laws. Concerning the quotation of the norms, I indicate the reference to the French *Codes*. References to the original texts of the law (which are designated by a number, a title and a date) are also specified, in foot notes. Moreover, the modifications Articles of the *Codes* had undergone either during the period 1992-2005, or after this period, are also indicated in foot notes.

The *Codes* and all the French legislation are available on the official French State website: www.legifrance.gouv.fr. English versions of some of *Codes* are also available on this governmental web site. As far as possible, in the quotation, I resort to the English versions provided by www.legifrance.gouv.fr; the laws available only in French have been translated by the author.

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structure made of three key chronological stages, the public inquiry takes place toward the end of the second stage.

I.1. Before the Public Inquiry

The public engagement is organised under the provisions of Article L 300-2 of the *Code de l'Urbanisme*.[94] This article gives a great freedom of manoeuvre to *communes* and public establishments for inter-*commune* cooperation regarding the organisation of public engagement mechanisms since they decide on the mode of involvement of the public:

> "I. town council or deliberative organ of public establishment for inter-*commune* cooperation deliberates on the modes of involvement of the public and on the pursued purposes, associating during the entire duration of the elaboration of the project, the residents, local NGOs, and other concerned persons among whom the representatives of agricultural profession before:
>
> a) any elaboration or review of the land development plan or of the local plan of urbanism;
> b) any creation, on its initiative, of a plan for territorial consistency;
> c) any development operation realised by a *commune*, or on its behalf where, due to its importance or nature, this operation modifies in a substantial way the living environment or the economical activity of the *commune*, if it is not realised in an area which has already been defined in the framework of the above points a) or b). […] " [95]
>
> (Code de l'Urbanisme, Legifrance, 2009, Emphasis added[96])

[94] According to article L 121-2 of *Code de l'environnement,* before the public enquiry, public engagement is organised either under the conditions of the National Public Debate Commission, or under the conditions of Article L. 300-2 of the *Code de l'Urbanisme*. As explained in section IV of this chapter, the National Public Debate Commission does not apply in the case of the setting up of incineration plants.

[95] Transalted by the author with the help of the website edited by *Centre de Documentation de l'Urbanisme, Ministère de l'Equipement* (Urbanism Documentation Center, Minister for Infrastructure), www.urbamet.com; original version :
"I- Le conseil municipal ou l'organe délibérant de l'établissement public de coopération intercommunale délibère sur les objectifs poursuivis et sur les modalités d'une concertation associant, pendant toute la durée de l'élaboration du projet, les habitants, les associations locales et les autres personnes concernées dont les représentants de la profession agricole, avant :
a) Toute élaboration ou révision du schéma de cohérence territoriale ou du plan local d'urbanisme ;
b) Toute création, à son initiative, d'une zone d'aménagement concerté ;
c) Toute opération d'aménagement réalisée par la *commune* ou pour son compte lorsque, par son importance ou sa nature, cette opération modifie de façon substantielle le cadre de vie ou l'activité économique de la *commune* et qu'elle n'est pas située dans un secteur qui a déjà fait l'objet de cette délibération au titre du a) ou du b) ci-dessus."

[96] *Loi n° 85-729 du 18 juillet 1985 art. 1 Journal Officiel du 19 juillet 1985 ;*
Loi n° 88-1202 du 30 décembre 1988 art. 57 Journal Officiel du 31 décembre 1988 ;
Loi n° 2000-1208 du 13 décembre 2000 art. 25 Journal Officiel du 14 décembre 2000 ;
modified by *loi n° 2003-590 du 2 juillet 2003 art. 42, art. 43 Journal Officiel du 3 juillet 2003*, but these changes do not affect the freedom of manoeuvre for the organisation of theengagement of the public.

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Moreover, the common provisions of *Code de l'Environnement* do not much more specify the modes of involvement of the public since the point II.4 of article L 110-1 only indicates that

> "the principle of participation, according to which everybody has access to information relating to the environment, including information relating to hazardous substances and activities, and whereby the public is involved in the process regarding the development of projects that have a major impact on the environment or on town and country planning."
>
> (article L 110-1, Environmental Code, Legifrance and Michael Faure, 2006[97])

I.2. Public Inquiry

Public inquiries (*enquêtes publiques*) are ruled by articles L123-1 to L123-16, and R123-1 to R 123-46 of the *Code de l'Environnement.*[98] During the decision-making process, the public inquiry is actually the first mechanism which obliges the elected local decision-makers to involve the public. The purpose of a public inquiry " […]is to inform the public and to collect its opinions, suggestions and counter-proposals […] in order to give the competent authority all the information it requires.[…]" (article L 123-3, Environmental Code, Legifrance and Michael Faure, October 2006). However, the public inquiry is initiated only after the decision-making process has been under way for a considerable amount of time. Groupings of *communes* have to sponsor the public enquiry after it has selected a waste treatment technology (here incineration), and a developing company (which is planned to run the facility). Indeed, the same article 123-3 specifies that the public inquiries "follow[s] the impact study when this study is required", and in the case of the waste treatment facility projects, such a study is required. And, as a matter of fact, the impact study of a facility such as an incineration plant can be made only after the facility has been designed. So, the public inquiry can be realised only once the project is defined, when almost everything has been decided. The results of the public inquiry have to be communicated to the *préfet* together with the request for the authorisation to operate. I remind that this request to the *préfet* is made together by the grouping of *communes* and the developing company (see section II of chapter 3 for further details about the involved actors). The delivering of the authorisation to operate is the very last step before the beginning of the building.

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[97] *Loi n° 2002-276 du 27 février 2002 art. 132 Journal Officiel du 28 février 2002*

[98] *Loi n° 83-630 du 12 juillet 1983* about public enquiries, called *Loi Bouchardeau*,;
Loi 95-101 du 2 février 1995 about the enforcement of environmental protection, called *Loi Barnier*;
Loi 2003-699 du 30 juillet 2003 concerning the prevention of major technological risks ;
Loi n° 2002-276 du 27 février 2002 Journal Officiel du 28 février 2002 about democracy of 'proximity'.

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The procedure and course of the public inquiry are governed by articles L123-4 to 123-16, and R123-1 to R123-23 of the *Code de l'Environnement*. The inquiry is conducted, according to the nature and scale of the operations, by a *commissaire enquêteur* or by an inquiry commission, both of them appointed by the President of the relevant administrative tribunal or by a member of this tribunal, delegated by the President for this purpose. Under the terms of article 123-7 of the *Code de l'environnement*:

> "At least fifteen days before the inquiry is opened and throughout its duration, the competent authority [in this research: a grouping of *communes*] informs the public by all appropriate means, notably in the places concerned by the inquiry and, according to the scale and nature of the project, via the written press or by audiovisual communication, of the purpose of the inquiry, the names and capacities of the *commissaire enquêteur* or the members of the inquiry commission, the date on which the inquiry is opened, the place of the inquiry and its duration. The duration of the inquiry must not be less than one month. By a reasoned decision, the *commissaire enquêteur* or the President of the inquiry commission may prolong the enquiry for a maximum period of fifteen days."

The residents who have access to the impact study can write down their observations on registers and have the possibility to individually meet the *commissaire enquêteur* or the inquiry commission (See article R123-17 of the *Code de l'Environnement*). The developer must bear the costs of the inquiry (*Code de l'Environnement*, article L123-14[99])

Under the terms of article L123-9 of the *Code de l'Environnement*, the *commissaire enquêteur* or the inquiry commission may organise a meeting in order to provide and exchange information with the public in the presence of the developer.[100] Since August 2003, in the case of waste treatment facilities, the organisation of such meetings is compulsory if it is requested by the mayor of the *commune* which hosts the facility, or by the President of the concerned public establishment for inter-*commune* cooperation. [101]

[99] *Loi n° 2002-276 du 27 Février 2002 Article 142 JournalOfficiel du 28 Février 2002*
[100] Furthermore, he/she receives the developer of the operation concerned by the public inquiry (inserted by *Loi n° 2002-276 du 27 février 2002 art. 141 Journal Officiel du 28 février 2002*; may receive all documents, visit the site concerned, convene the developer as well as the interested administrative authority.
[101] Inserted by *Loi n° 2003-699 du 30 juillet 2003 art. 1 Journal Officiel du 31 juillet 2003*

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I.3. After the opening of an incineration plant: Local Commission for Information and Monitoring

> "1° Each individual has the right to be informed about the harmful effects on human health and the environment of the collection, transport, treatment, storage and deposit of waste as well as about the measures taken to prevent or compensate for these effects […]"

(article 125-1, point I, Environmental Code, Legifrance and Michael Faure, October 2006). After the opening of an incineration plant, this right implies the creation of a Local Commission for Information and Monitoring (*Comité Local d'Information et de Surveillance,* usually called *CLIS)*. More generally, under the terms of article 125-1[102] , a Local Commission for Information and Monitoring is created on any waste disposal or storage site, on the initiative of either the *Préfet,* or of the town council of the *commune* hosting the facility or of a neighbouring *commune*. This commission is composed in equal parts of: representatives of the public administrations concerned, the operator of the facility, the local authorities (*i.e.* the public grouping of *communes*), and the environmental protection associations concerned. On the request of the commission the *Préfet*, who chairs the commission, orders the inspection operations that the commission deems necessary for its works. With regard to the content of the information available for the members of the commission, "the documents drawn up by the operator of a waste disposal establishment to measure the effects of its activity on public health and the environment are sent to the commission" (article 125-1, point II.2°, Environmental Code, Legifrance and Michael Faure, October 2006). As for the cost of setting up and running of the commission, they are borne equally by the State, the local authorities and the operator.

II. Discretionary Provisions

In addition to these legal obligations, local decision-makers have at their disposal three other legal tools to involve the public during the decision-making process: Local Commissions for Information and Monitoring (*Commission Locale d'Information et de Surveillance, CLIS*), local referendums (*referendums locaux*), district councils (*conseils de quartier*), and consultative committees (*commissions consultatives*).

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[102] *LOI no 92-646 du 13 juillet 1992* relative à l'élimination des déchets ainsi qu'aux installations classées pour la protection de l'environnement
Inserted by Ordonnance n° 2001-321 du 11 avril 2001 art. 9 I, II Journal Officiel du 14 avril 2001

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II.1. Local Commission for Information and Monitoring

From 1993, The *Préfet* has the possibility to set up a Local Commission for Information and Monitoring (*Commission Locale d'Information et de Surveillance, CLIS*) for the waste treatment facilities project, that is, during the decision-making process. This commission is exactly the same as the one described above in the compulsory provisions, the only difference is that before the opening of the incineration the setting up of such a commission is not an obligation. On the request of a *commune* situated inside the 'radius of posting' (i.e. 2 Km for incineration plants), the creation of a Local Commission for Information and Monitoring is compulsory (article R125-5, *Code de l'environnement*[103], and *Décret n°53-578 du 20 mai 1953* concerning the Nomenclature of classified facilities).

II.2. Local Referendum

Before 2003, the consultation of the voters through a local referendum (*referendum local*) already existed (*Code Général des Collectivités Territoriales* article L2142-1 and following.)[104] However, the terms of these articles presented two limitations: first, only the *communes* could organise local referendums; and above all, referendums were merely consultative, the results of a referendum are not binding on the decision-makers. But, law n°2003-705 of the 1st August 2003[105] overcomes these limitations. Firstly, public establishments for inter-*commune* cooperation (among which the grouping of *communes* in charge of the waste treatment) also have the possibility to organise referendums. Furthermore, the consulted voters actually decide since the local elected decision-makers have to implement the result of the referendum. Groupings of *communes* (and more generally public establishments for inter-*commune* cooperation and municipalities) have the possibility to organise local referendums to solve whatever kind of problem which is in its area of competence.[106] However under the terms of article 5211-49[107] of the *Code Général des Collectivités Territoriales* the public establishments for *inter-communes* cooperation can also organise a local referendum in which only an opinion is asked to the voters without any

[103] *Décret en Conseil d'Etat 93-1410 du 29 décembre 1993 Journal Officiel "Lois et Décrets" du 31 décembre 1993*
[104] *Loi n° 92-125 du 6 février 1992 Journal Officiel du 8 février 1992*
[105] Articles from LO 1112-1 to LO 1112-14 of the *Code Général des collectivités territoriales*
[106] In fact,
[107] *Loi n° 99-586 du 12 juillet 1999 art. 43 Journal Officiel du 13 juillet 1999, modified by Loi n° 2004-809 du 13 août 2004 art. 122 II Journal Officiel du 17 août 2004 en vigueur le 1er janvier 2005*

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constraint on the final decision made by the elected decision-makers. In any case, the organisation of a local referendum by the public establishments for *inter-communes* cooperation is not an obligation at all, only a possibility.

II.3. District councils

Under the terms of article L2143-1 of the *Code Général des Collectivités Territoriales*[108], in the *communes* with more than 80 000 residents, the town council defines the limits of the districts. Each district has to be provided with a council, which is called the district council (*conseil de quartier*). The composition and mode of functioning of these district councils are set-up by the town council. A district council can be consulted by the mayor about any issue concerning the area or the town. Mayors have the possibility to associate district councils to the projects concerning their district, respectively. Mayors are not obliged, however, to resort to district councils. In the *communes* from 20 000 to 79 999, the setting up of such councils is a possibility, but not an obligation.

II.4. Consultative Committees

A *commune* or a public establishment for *inter-communes* cooperation can set-up some consultative committees (*commissions consultatives*) concerning matters in its area of competences, including waste treatments (see articles 2143-2[109] and 5211-49-1[110] of the *Code Général des Collectivités Territoriales*). The members are appointed by a *commune* or public establishment for *inter-communes* cooperation on the proposal of the mayor or of the president, so there is little constrain about the members who compose these committees, even if, for the public establishment for *inter-communes* cooperation, the members must be appointed according to their representativeness or competencies, and representatives from local NGOs can be also appointed. A shortcoming of such committees is that their composition, once determined, cannot be changed. Indeed, they are set-up on a medium term

[108] *Loi n° 2002-276 du 27 février 2002 art. 1 I Journal Officiel du 28 février 2002 ;*
inserted by *Loi n° 2002-276 du 27 février 2002 art. 1 II Journal Officiel du 28 février 2002*
[109] *Loi n° 96-987 du 14 novembre 1996 art. 39 Journal Officiel du 15 novembre 1996 ;*
Loi n° 2002-276 du 27 février 2002 art. 1 I, 2 Journal Officiel du 28 février 2002
[110] *Loi n° 99-586 du 12 juillet 1999 art. 43 Journal Officiel du 13 juillet 1999 ;*
Loi n° 2002-276 du 27 février 2002 art. 5 V Journal Officiel du 28 février 2002

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basis, so they are unable to take into account emergent actors such as the NGOs which are especially created to oppose a project.

III. Other Provisions

In case of existing waste treatment facilities or existing 'waste services', two provisions makes compulsory the creation of two commissions where local elected decision-makers and local NGOs meet: the Local Public Services Consultative Commissions (*Commissions Consultatives des Services Publics Locaux*), and the Local Commissions for Information and Monitoring (*Commissions Locales d'Information et de Surveillance, CLIS*). These commissions are not directly linked to the decision-making process, but they are places where residents and local decision-makers can meet in case of existing facilities or services.

III.1. Local Public Services Consultative Commissions

From February 2003, the *communes* with more than 10000 residents, public establishments of *inter-communes* cooperation with more than 50000 residents, and mixed syndicates including at least one *commune* with more than 10.000 residents have to set up a local public services consultative commission (see article L1413-1 of the *Code Général des Collectivités Territoriales*[111]). This commission deals with the local services which are provided either by a private company through an outsourcing of public services, or by companies under local government control and which have a financial autonomy. This commission is composed of local decision-makers and of representatives of local NGOs. This commission has two main duties: first to produce an annual report on the quality of the service; second, it has to be consulted about projects concerning local government companies having a financial autonomy. This second attribution is quite important for this research since waste treatment facilities are operated by private companies through an outsourcing of public services, or by companies under local government control and which have a financial autonomy. So from February 2003, big *communes* or grouping of *communes* are obliged to involve local NGOs in the decision-making processes concerning the setting-up of waste treatment facilities.

[111] *Loi n° 2002-276 du 27 février 2002 art. 5 I, 23 II Journal Officiel du 28 février 2002 en vigueur le 28 février 2003;*
Ordonnance n° 2004-559 du 17 juin 2004 art. 15 Journal Officiel du 19 juin 2004

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III.2. Local Commission for Information and Monitoring

A waste disposal or a storage site may already exist when the decision to set up a new waste treatment facility is taken, and thus a Local Commission for Information and Monitoring might already exist for these facilities. Even if these Local Commissions for Information and Monitoring are not part of the decision-making process, they are places where local decision-makers and local environmental protection NGOs are used to meet. And these meetings could be the occasion to talk about the new waste treatment facility project.

IV. The National Public Debate Commission and the Aarhus Convention

As I have already stated in the introduction to this chapter, the *Commission Nationale de Débat Public* (National Public debate Commission) is not in charge of the setting up of incineration plants, and the Aarhus convention does not apply to the selected decision-making processes. However, in order to grasp the trend of the French and European legislation with regard to the participation of the public, it is interesting to introduce them.

IV.1. The National Public Debate Commission

The National Public Debate Commission (*Commission Nationale de Débat Public*), created in 2002, is in charge of the public participation in environmental decision-making processes:

> "the National Public Debate Commission, an independent administrative authority, is responsible for ensuring the respect of the principle of public participation in the development of town and country planning or infrastructure projects of national interest of the State […] as soon as these projects are socio-economically significant or have significant impacts on the environment or on town and country planning. […]".
>
> (articles L 121-1, Environmental Code, Legifrance and Michael Faure, October 2006)[112]

The aim of the National Public Debate Commission is to ensure a strong participation of the public from the very outset of the decision-making process: under the term of the same article L121-1, "[…] Public participation may take the form of a public debate. This debate covers the suitability, the objectives and the principal characteristics of the project. Public participation is ensured throughout the entire development phase of a project, from the undertaking of preliminary studies through to the end of the public enquiry. […]"

[112] *Loi n° 2002-276 du 27 février 2002 art. 134 Journal Officiel du 28 février 2002*

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The National Public Debate Commission does not apply to the decision-making processes selected for this research because household waste incineration plants are not considered as infrastructure projects of national interest of the State. [113]

IV.2. The Aarhus Convention

The convention of Aarhus has substantially modified the French legal framework concerning the participation and information of the public. The convention of Aarhus is a European convention the objective of which is to "[…]guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters[…]. (article 1).[114] It was signed in 1998 by States members of the Economic Commission for Europe as well as States having consultative status with the Economic Commission for Europe. France signed the convention on the 25th June 1998 and ratified it on the 8th July 2002. France has enforced this convention in the French legislation on two occasions. Firstly, the convention has been enforced as such on the 6th October 2002 through the *Décret n° 2002-1187 du 12 septembre 2002 Journal Officiel du 21 septembre 2002.* In a second time, four years later, the *Code de l'environnement* has been updated through the *Décret no 2006-578 du 22 mai 2006* concerning the information and participation of the public with regard to environmental matters.[115] Let's note that this convention could not be applied to the decision-making processes studied in this research since they started at the beginning of the 1990's and ended between 2003 and 2005. However, it shows a legislative trend toward more public participation.

The convention deals with environmental matters, in a wide sense, from the building-up of regulations to decisions on specific activities. Since this research is about the setting-up

[113] The categories of infrastructure projects that the National Public Debate Commission deals with are listed by a *Conseil d'Etat* (the highest administrative court in France) decree, and incineration plants are not part of this list (see article R 121-1 of the *Code de l'Environnement*). Furthermore, on the 1st December 2004, the National Public Debate Commission declared non admissible the submission by the public establishment for inter-*commune* cooperation *Marseille Provence Métropole* of their incineration plant planning (Commission Nationale du Débat Public, 2006).
See below, "about the National Public Debate Commission" for more details.
[114] See the United Nations Economic Commission for Europe webpages dedicated to the Aarhus convention: http://www.unece.org/env/pp/welcome.html
[115] *Décret no 2006-578 du 22 mai 2006 relatif à l'information et à la participation du public en matière d'environnement, Journal officiel du 23 mai 2006*

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of waste treatment facilities, I focus on article 6 which deals with "public participation in decisions on specific activities"[116]:

> "[…] 2.The public concerned shall be informed, either by public notice or individually as appropriate, early in an environmental decision-making procedure, and in an adequate, timely and effective manner [...]
>
> 3. The public participation procedures shall include reasonable time-frames for the different phases, allowing sufficient time for informing the public in accordance with paragraph 2 above and for the public to prepare and participate effectively during the environmental decision-making.
>
> 4. Each Party shall provide for early public participation, when all options are open and effective public participation can take place.
>
> 5. Each Party should, where appropriate, encourage prospective applicants to identify the public concerned, to enter into discussions, and to provide information regarding the objectives of their application before applying for a permit.
>
> 6. Each Party shall require the competent public authorities to give the public concerned access for examination, upon request where so required under national law, free of charge and as soon as it becomes available […]
>
> 7. Procedures for public participation shall allow the public to submit, in writing or, as appropriate, at a public hearing or inquiry with the applicant, any comments, information, analyses or opinions that it considers relevant to the proposed activity.
>
> 8. Each Party shall ensure that in the decision due account is taken of the outcome of the public participation.
>
> 9. Each Party shall ensure that, when the decision has been taken by the public authority, the public is promptly informed of the decision in accordance with the appropriate procedures. Each Party shall make accessible to the public the text of the decision along with the reasons and considerations on which the decision is based.
>
> 10. Each Party shall ensure that, when a public authority reconsiders or updates the operating conditions for an activity referred to in

[116] In the Aarhus convention, "party" means a contracting party to the convention.

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paragraph 1, the provisions of paragraphs 2 to 9 of this article are applied mutatis mutandis, and where appropriate. […]" (Emphasis added)

The convention does not set-up any specified procedures, however it indicates very specific guidelines about the participation of the public. Not only does this convention oblige the local-decisions makers to make easy the participation of the concerned public but also oblige them to look for this concerned public. The participation of the public is really guaranteed since the public must be involved at the outset of the decision-making process, "when all options are open", and time must be given to the public, so that he can prepare itself for an efficient participation. Furthermore, decision-makers must take into account the outcome of the public participation, and then motivate their final decisions, specifying the reasons and consideration on which the decision is based.

V.Summary and Conclusion

The convention of Aarhus and the *Commission Nationale de Débat Public*, which provide for an important public participation from the outset of decision-making processes, do not apply to the setting up of incineration plants. In fact, during the decision-making processes for the setting up of incineration plants, there are little legal constrains concerning public engagement: the groupings of *communes* have the liberty to decide themselves "the modes of involvement of the public" (article L 110-1, Environmental Code, Legifrance and Michael Faure, October 2006). In other words, at the outset of the decision-making processes, the groupings of *communes* in charge of the setting up of incineration plants have no obligation to engage the public: there is no obligation to inform, to consult, or to sponsor a participation of, the public. The only compulsory engagement mechanism, a public inquiry, comes late in the decision-making process: it takes place only once the incineration plant project has been completely defined, just before the beginning of the construction. In other words, it comes when the '*degree of manoeuvre*' is very low; almost everything has already been decided. Furthermore, with this public inquiry there is no direct flow of information between the public and the grouping of *communes*, but between the public and the *Préfet*. Moreover, this flow of information is indirect: there is no meeting between the public and the *Préfet*: information reaches the *Préfet* through a *commissaire-enquêteur* who gathers and synthethises the opinion of the residents and of the local NGOs through meetings and (mainly) registers. This is only after the opening of an incineration plant that there is an obligation to set up a place where the operator, the local decision-makers, and the public regularly meet. This place is the Local

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Commission for Information and Monitoring. However, only local environmental NGOs are authorised to participate, the law makes no provisions for the participation of residents as natural persons.

Beyond the compulsory mechanisms, the groupings of *communes* can organise consultations of the voters, either in the form of a local referendum which constrains the final decision made by the elected decision-makers, or in the form of a simple consultation which merely aims to gather the opinion of the residents. In other words, when they decide to organise a referendum, the local elected decision-makers have to choose whether they want it to be binding or not. Furthermore, in cities with more than 80 000 residents, mayors can consult the district councils and associate them with the project.

In case of already existing facilities, some places where local NGOs and decision-makers meet, the local public services consultative commission and the Local Commission for Information and Monitoring are provided by the law. In that case, concerned local NGOs and decision-makers have opportunities to meet each other and to talk about the project.

To conclude, the groupings of *communes* in charge of the setting up of an incineration plant project have a lot of possibilities and freedom to engage the public and very little constraints.

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Chapter 6
Public Engagement
in the
Ten Decision-Making Processes

This chapter intends to provide answers to the three first research questions: "1. to what extent is the public actually engaged along the local decision-making processes?"; " 2. what is the political will to involve the public?"; and " 3. what is the impact of the public engagement on the decision-making processes (i.e. on the degree of controversy, and on the completion/ abandonment of the initial project)?". The chapter is thus made up of four sections. In section I, the public engagement mechanisms used in the ten decision-making processes are listed and a typology of the mechanisms is developed. Section II defines the three key chronological stages for the ten-decision-making processes. Section III assesses the extent to which the types of engagement mechanisms defined in section I have been actually used by the public authority and by the NGOs along the decision-making processes. This section is concluded by the assessment of the political will of the local decision-makers to engage the public. At last, in section IV, I evaluate the impact of the public engagement on the decision-making processes.

I. Public Engagement Mechanisms: A Typology

This section develops a typology of the public engagement mechanisms actually used in the ten decision-making processes. The data analysis method is made of three main steps. Firstly, all the mechanisms quoted in the interviews by the NGOs and the public authorities

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have been listed, without considering the frequency of their use: even if a mechanism has been used only one time in one decision-making process, it has been listed (the frequency of use of the respective mechanisms is actually discussed in the section III of this chapter). Secondly, for each mechanism, the class has been established (i.e. top-down communication, top-down consultation, etc), and the structural variability (*i.e.* the state of the eight significant characteristics of the mechanisms) has been determined. The list of the mechanisms actually used, with the values of their eight significant characteristics, can be found in the appendix "Public Engagement Mechanisms Classified according to their Key Characteristics". Thirdly, the mechanisms having their eight significant charateristics in the same state have been clustered and form a type of mechanisms; each type has been labelled by a number.

This section has been divided in seven sub-sections, one for each class of mechanism: top-down public communication, consultation, and participation; no engagement; bottom-up public communication, consultation, and participation.

All the types of mechanisms have been summarised in a table. In this table, for each mechanism, the class, type, and the state of the significant charateristics are stated. A short description which includes complementary information is also provided (see table 5, below).

The seven sub-sections and the table 5 are complementary. The table takes again the greatest part of the information which is developed in the seven sub-sections, but while advantages and disadvantages of the mechanisms are more extensively described in the text than in the table, the structural variability is exhaustively described only in the table.

Let me remind the reader that in this research the public authorities are the grouping of *commune* in charge of the waste treatment or the *Préfet*. As for the public, for the top-down mechanisms, it consists of the NGOs, groups of (notably economical) interest, other organisations, or natural persons. For the bottom-up mechanisms, the public considered is different: is the engaged NGOs (the reasons of these choices concerning *'public authority'* and *'public'* can be found in chapter 3, section X). Finally, the term *'association'* is referred to as inclusive of NGOs, groups of (notably economical) interest, or other organisations.

In the ten decision-making processes, 19 top-down public engagement mechanisms and 15 bottom-up mechanisms have been listed. More precisely, I have identified 13 types of public top-down and 8 types of bottom-up engagement mechanisms. The types are labelled with a number: type 1, type 2, etc. The types already developed by Rowe and Frewer are marked with one asterisk ("*"), while the ones I have developed in this research are marked with two asterisks ("**"). Some 'type number' are not present in this typology since the number

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corresponds to a type identified by Rowe and Frewer, but which is not present in this research. At last, in table 5, in each class, the types of mechanisms are listed in the increasing order of efficiency.[117]

I.1. Top-down Mechanisms

Top-down Communication

Five types of top-down communication mechanisms have been identified. These are type 1* (traditional publicity through the broadcasting of information), type 2* (public meeting, district councils), type 3* (exhibition, web site), type 5** (meetings with Associations), and type 6** (Phone communication with associations).

*'**Top-down communication type 1***'* mechanisms are the traditional communication tools, typically used as part of public information programs, through which a particular population is targeted (in that sense, the selection of the public is controlled) with set information, via a variety of (non face-to-face) media. The mechanisms actually used are newsletters, press releases, radio broadcasts, and letters to associations. Newsletters allow lengthy and quite complete presentations of the project, and a high control of the selection of the public, but the cost of distribution, entirely covered by the public authority, is quite high. Press releases are far less expensive for the public authority but the control on the selection is less important: the public is only partially targeted through the selection of a certain type of newspaper. For both mechanisms, an advantage is that the readers have the possibility to go back to stable and first hand information. The disadvantage is that information is set and no interactivity is possible.

The mechanisms of the **top-down communication type 2*** are either public meetings especially organised on the occasion of the incineration plant project (Eventually with question-and-answer session), or district councils which are meetings regularly organised by the municipal authority in the quarters. These mechanisms rely on the public to come to the information rather than vice versa. As such, the involved public is largely self-selected and biased in terms of those most proactive and interested. Information, which is communicated face-to-face by public authorities to those involved, is flexible, depending to some degree on what participants ask. This flexibility enables the delivery of information corresponding more

[117] I remind that in this research, efficiency means "maximizing the relevant information (knowledge and/or opinions) from the maximum number of relevant sources and [in] transferring this efficiently to the appropriate receivers" (Rowe G. and Frewer L.J. 2005, p. 263). See chapter 4 for further details.

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to the expectation of the public. However, this information is no longer available once the meeting is over.

The **top-down communication mechanisms type 3*** are web sites and exhibitions. These mechanisms rely on the public to come to the information. The information is set and is delivered through non face-to-face media. Whereas this definition is unproblematical for (non-interactive) websites, further details must be given concerning exhibitions. The information is set in that the public can only acquire what the sponsor makes available, although it is variable depending on what information is sought and when. Although there may be face to face contact with exhibition staff, these tend to be representatives of decision-makers directing the public to appropriate information. The exhibition staff tend not to be themselves significant information sources. These considerations about the flexibility and the face-to-face aspect depend on the way the exhibitions are actually organised. Websites allow for very lengthy description of the project and first hand information is available twenty four hours a day. Even if information is set, a certain flexibility is possible, or rather, a certain interactivity. An advantage is that the cost is rather low. A disadvantage is that not only does it rely on the public to come, but only the public having access to internet can come. Exhibitions create an event and make the project lively. However, information is available only over a short period of time. On another note, a long tem exhibition is costly.

The **top-down communication mechanisms of type 5**** are meetings with the members of associations or with their representatives, and visits of existing waste treatment facilities with associations. As for top-down information type 2*, information is provided face-to-face and is flexible, response to individual query is supplied. The difference is that in the present type, the public is highly selected. Three mechanisms were used by the public authorities, formal and informal meetings with associations, visits of existing facilities with associations, and (compulsory) Local Commissions for Information and Monitoring. The meetings with associations can be either meetings with all the members of the association(s), in that case they are similar to the public meetings, or they can me more limited, including only the representatives of the association(s). Flexibility of the information delivered is enhanced thanks to the (usually) low number of participants which allow a greater interactivity. Concerning the visits of existing waste treatment facilities, invitations are sent to representatives of the association(s). Usually, these visits also involved elected decision-makers, some administration staff and sometimes journalists. As for Local Committees for

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Table 5. Typology of the engagement mechanisms used in the ten studied decision-making processes (inspired from rowe and frewer, 2005)

Mechanism Class	Mechanism Type	Mechanisms actually used	State of the significant characteristics
Top-down Communication	Top-down communication type 1* (traditional publicity)	Information broadcasts ('Publicity' via newsletters/ Journal, press releases, radio broadcasts, letters to associations)	– Participation selection method: Controlled – Information input: set information – Medium of information: Non face-to-face
	Top-down communication type 2*	Public Meeting (Eventually with question-and-answer session) District councils	– Participation selection method: Uncontrolled – Information input: Flexible information – Medium of information: face-to-face
	Top-down communication type 3*	Public authority (non interactive) web site Exhibition	– Participation selection method: Uncontrolled – Information input: set information – Medium of information: Non face-to-face
	Top-down communication type 5**	Formal / Informal Meetings with Associations Visits of existing facilities with Associations (compulsory) Local Commission for Information And Monitoring	– Participation selection method: Controlled – Information input: Flexible information – Medium of information: face-to-face
	Top-down communication type 6**	Phone Communication with Associations	– Participation selection method: Controlled – Information input: Flexible information – Medium of information: Non face-to-face
Top-down Consultation	Top-down consultation type 1*	Opinion Survey Local referenda	– Participation selection method: Controlled – Facilitation of information elicitation: No – Response mode: Closed – Medium of information: Non face-to-face – Facilitation of agregation: Structured combination
	Top-down consultation type 2*	Consultative Committee	– Participation selection method: Controlled – Facilitation of information elicitation: No – Response mode: Open – Medium of information: Non face-to-face – Facilitation of agregation: Unstructured combination
	Top-down consultation type 4*	Consultation meeting with representatives of associations	– Participation selection method: Controlled – Facilitation of information elicitation: Yes – Response mode: Open – Medium of information: face-to-face – Facilitation of agregation: Unstructured combination
	Top-down consultation type 5*	Consultation public meeting	– Participation selection method: Uncontrolled – Facilitation of information elicitation: No – Response mode: Open – Medium of information: face-to-face – Facilitation of agregation: Unstructured combination

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Top-down Participation	Top-down participation type 1*	Action Planning Workshop *(Départemental* commission for the disposal of household and similar waste plan ; *commission départementale pour le plan d'élimination des déchets des ordures ménagères)*	– Participation selection method: Controlled – Facilitation of information elicitation: Yes – Response mode: Open – Information input: Flexible information – Medium of information: face-to-face – Facilitation of agregation: Unstructured combination
	Top-down participation type 3**	Non compulsory and Compulsory Local Commission for Information and Monitoring	– Participation selection method: Controlled – Facilitation of information elicitation: No – Response mode: Open – Information input: Flexible information – Medium of information: face-to-face – Facilitation of agregation: Unstructured combination
	Top-down participation type 4**	Registre d'enquete (Enquiry Register) (Compulsory Public Enquiry)	– Participation selection method: Uncontrolled – Facilitation of information elicitation: Yes – Response mode: Open – Information set – Medium of information: Non face-to-face – Facilitation of agregation: Unstructured combination
	Top-down participation type 5**	*Interview with commissaires enquêteurs* (compulsory public enquiry)	– Participation selection method: Uncontrolled – Facilitation of information elicitation: Yes – Response mode: Open – Information input: set information – Medium of information: face-to-face – Facilitation of agregation: Unstructured combination
No Engagement	No Engagement type 1.** No Mechanism	No Initiative	– No characteristic
	No Engagement type 2. ** Legal Action	Administrative Action Criminal Action	– Take place in court
Bottom-up Consultation	Bottom-up consultation type 1**	Association meeting with the participation of the public authority	– Addressee of information: Public authority – Participation selection method: Controlled – Response mode: Open – Medium of information: face-to-face – Facilitation of agregation: Unstructured combination
	Bottom-up consultation type 2**	Request of Documents	– Addressee of information: Public authority – Participation selection method: Controlled – Response mode: Open – Medium of information: Non face-to-face – Facilitation of agregation: Unstructured combination

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Bottom-up Communication	Bottom-up communication type 1** (traditional public protest)	Demonstration Petition Protest letter sent to policy-makers	- Addressee of information: Public authority - Participation selection method: Controlled - Information input: set information - Medium of information: Non face-to-face - Argumentation: No
	Bottom-up communication type 2**	Opposition association press release Opposition Open Letters	- Addressee of information: Larger public - Participation selection method: Controlled - Information Set - Medium of information: Non face-to-face - Argumentation: No
	Bottom-up communication type 3**	Association Information broadcast ('Publicity' via newsletters/ Journal, newspaper, open Letters, press release, radio broadcast)	- Addressee of information: Larger public - Participation selection method: Controlled - Information input: set information - Medium of information: Non face-to-face - Argumentation: Yes
	Bottom-up communication type 4**	Association exhibition Association web site	- Addressee of information: Larger public - Participation selection method: Uncontrolled - Information input: set information - Medium of information: Non face-to-face - Argumentation: Yes
	Bottom-up communication type 5**	Association conferences Association public meeting	- Addressee of information: Larger public - Participation selection method: Uncontrolled - Flexible information - Medium of information: face-to-face - Argumentation: Yes
	Bottom-up communication type 6**	Association newsletter, reports, or expertises, sent to policy-makers	- Participation selection method: Controlled - Addressee of information: Public authority - Information input: set information - Medium of information: Non face-to-face - Argumentation: Yes
Bottom-up Participation	Bottom-up participation type 1**	Not present in this research. For illustration, existing mechanisms that can be found in the Science Study literature:: Community based research Patient association	- Participation selection method: Controlled - Addressee of information: Public authority - Information input: Flexible information - Response mode: Open - Medium of information: face-to-face - Argumentation: Yes

*: type identified by Rowe and Frewer (2005)
**: type developed by the author

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Information and Monitoring, it is sometimes difficult to decide whether to categorise them as top-down communication exercises or as top-down participation exercises; it depends on the way public authority considers and thus organises it. However, a distinction can be made between the compulsory and the non-compulsory commissions. Compulsory commissions are more likely to be a communication exercise. Indeed, by law, these committees are compulsory only after the opening of an incineration plant, once there is basically nothing to decide; the aim of such commissions is that local decision-makers and the operator distribute information concerning the emission of pollutants to selected NGOs and other organisations. However, in some cases, requests provided by representatives of the public, such as the installation of extra measurements of pollutant emissions, have been taken into account. In these cases, the Local Commission for Information and Monitoring is another class of mechanisms (top-down participation type 3*). The non-Compulsory Local Commissions for Information and Monitoring are more likely to be top-down participation type 3* initiatives, but it depends upon the way it actually works.

Top-down communication type 6** mechanisms are phone communication with associations. Representatives are regularly contacted by public authority to be informed about the evolution of the project. Thus the public is highly selected. Even if information is not communicated face to face, phone communications allow flexibility. Another advantage is the low cost of such a mechanism.

Top-down Consultation

Four types of top-down consultation (type 1*, type 2*, type 4*, and type 5*) have been identified. Opinion survey, and referenda, are top-down consultation type 1* mechanisms. These mechanisms are essentially highly controlled ways of acquiring answers to specific questions from large samples. Quantity of data is more important than quality. There is no facilitation of the elicitation of information, and possible answers are pre-selected. Theoretically, opinion surveys can be semi-structured questionnaires, what allows more flexibility for the answers, but makes difficult and above all costly the treatment of the answers collected. As for the aggregation of data, it is structured.

Only one mechanism, the consultative committee, makes up **the type 2***. This type aims to attain open responses on a significant issue from a selected part of the public. A consultative committee is basically composed of representatives of the civil society of a *commune* or a grouping of *communes*. This is a non face-to-face mechanism: elected decision-makers ask for a written report to the consultative committee about the topic in question. The consultative

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committee is not set up especially for the setting up of an incinerator, and the committee can be consulted about many kinds of projects. The limit of such committees is that they have not a flexible composition. Indeed, they are set-up on a medium term basis, so they cannot take into account emergent actors such as the NGOs which are especially created to get opposed to a project.[118]

The **type 4** of consultation mechanisms** consists of meetings with the associations in order to know their views concerning the issue at stake. Through the high selection of the participants, this type of mechanisms aims at gathering the views of a definite kind of public. The lack of elicitation of information of these face-to-face meetings is compensated by the fact that the meetings have a limited number of participants, one representative of the public authority, and a few representatives of the NGOs. In the cases studied, the meetings are rather informal and usually take place in the office of a member of the administrative staff. Because there is no significant information delivered by the public authority, this type of mechanisms may be seen as consultation rather than participation mechanisms.

None of the public authorities resorted to the focus groups, which is a type 4 mechanism which has been studied and promoted by many science studies scholars: (See for example Condit C. M., Parrott R. Harris T. M., 2002; Rowe G. and Frewer L.J. 2005). Focus groups have been used in a wide range of activities – e.g. testing the efficacy of propaganda films, marketing, and information campaigns- before being used in technical-scientific decision-making. Small groups are composed in order to reflect different categories of the public. These groups meet on a few occasions, in which a compere asks very general questions in order to get a free discussion going. More precisely, people (for each group) are randomly selected, often by telephone. The duration of each session is about 2 hours and each group meets weekly in a neutral place. Audio-visual presentations are often used because they likely to make easier the discussion by provoking an emotional state. The products of these discussions are some records, answers to questionnaires or reports. The role of the compere, who must not be an expert, is to facilitate the discussion. This procedure does not really allow an interactive confrontation between scientific expertise and the public. However, it has the advantage of allowing new positions to appear – something which is not possible with the pre-determined questions of the polls. It might indicate new tracks which should be

[118] See chapter 5 'Public Engagement: Legal Framework' for furter details about consultative committees

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investigated or at can at least modify the hierarchy of themes which are already the subjects of research.

Large-scale consultation of the residents through meetings is a **top-down consultation mechanism of type 5****. This class of mechanisms aims to attain open responses from a rather large percentage of the population on a significant issue. However, the selection of the public is not controlled and there is no facilitator. Thus, such mechanisms rely on the public to come and participate to the consultation. Such consultation meetings may be trusted by NGOs, and may be not representative of the actual resident views. In the public meeting, decision-makers present the issue at stakes (i.e. the incineration plant project) and then gather the reactions of the participants. Even if the public authority may take into account the result of the consultation in its final decision, the aim is not that the public authority and the public mutually change their views. Thus these meetings are consultation and not participation mechanisms.

Top-down Participation

Three mechanisms were actually used; these are (non-compulsory) Local Commission for Information and Monitoring, *registres d'enquête* (inquiry registers), and interviews with *commissaires enquêteurs* (commissioners); they can be respectively differentiated in three types of top-down participation: type 3**, type 4**, and type 5**. R*egistres d'enquêtes* and interviews with *commissaires enquêteurs* are both carried out in the framework of the compulsory *enquête publique* (public inquiry). The *registres d'enquête* are a **top-down participation mechanism of type 4****. These mechanisms rely on the public to come and consult information documents, and then to give its opinions in an open written form. The '*organizers'* and '*facilitators'* of these participation mechanisms are the *commissaires enquêteurs* (commisioners), who are appointed by the president of the local administrative tribunal. In the concerned town-halls, the '*organizers'* make available some documentation about the project, and they collect the opinions, suggestions, and counter-proposals of the public through the registers (public opinions are also gathered through individual meetings, see type 5 below). Finally, the commissioners aggregate the gathered information, and they write down a motivated favourable or unfavourable advice intended to the *préfet*. By law, the duration of a public inquiry must not be less than one month.

Individual interviews with *commissaires enquêteurs* belong to the **type 5** of top-down participation**. This class of mechanisms is similar to the type 4**. However, the flexibility of

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the responses is enhanced thanks to face-to-face meetings, which takes place in the concerned town-halls.

Finally, Non-compulsory Local Commissions for Information and Monitoring are **type 3** top-down participation mechanisms**. The selected participants, representatives of the associations, are provided with information, and they have the possibility to respond in an open way. Flexibility is also enhanced by the face-to-face exchange. However, there is no facilitated elicitation and no structured aggregation. The Local Commission for Information and Monitoring can be in this class when local decision-makers really want to take into account representatives of the public opinions. Before the opening of an incineration plant, the setting up of a Local Commission for Information and Monitoring is not compulsory. Compulsory and Non-Compulsory Local Committee for Information are organised in the same way. However, they are not the same type of mechanism. Indeed, compulsory committees are set-up after the opening of the incineration plant, when the decision-making process is over, and so when everything has been decided, whereas the non compulsory one can be set up during the decision-making process, when some issues are still under discussion. Thus, compulsory Local Commissions for Information and Monitoring are communication mechanisms, whereas the non compulsory ones are more likely to be participation mechanisms. However, it is not always easy to classify the Non Compulsory Local Commissions for Information and Monitoring because they can be used as communication, consultation, or participation mechanism depending on the public authority. The actual type of a non compulsory Local Commission for Information and Monitoring is linked to the stage in which it is organised. If such a committee is not set before the beginning of the second phase, it is likely to be a communication rather than a participation mechanism.

No **top-down participation mechanisms type 1*** have been used during the decision-making processes. This type groups together two of the three mechanisms which are representative of the highly participatory mechanisms studied and promoted by Science Studies scholars: consensus conference and citizens' jury.[119] This type is characterized by the controlled selection of participants, facilitated group (FTF) discussions, unconstrained participant responses, and flexible information input from the public authorities, often in the

[119] See among others: Renn O., Webler T. and Wiedemann P., 1995; Callon M., Lascoumes P. Barthe Y., 2001; Rowe, Gene and Frewer, Lynn J., 2005/4/1; Crosby N., 1995; Armour A., 1995; Joss S., 1998; Grundahl, J, 1995; Hamstra A., 1995; Mayer I., de Vries J. and Geurts J., 1995; Joss S., 1995; Blok A., 2007/4/1; Seifert F., 2006/1/1; Einsiedel E., Jelsoe E. Breck T., 2001/1/1.

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form of "experts" who are available for questioning by the public participants throughout numerous session spread on a few months.

Consensus conferences directly include the public in the discussions – thus discussions are not limited to the circle of experts and decision-makers. The discussions are about topical subjects that have a national dimension. The model of the consensus conferences is the Danish experience which took place in 1987 and dealt with health care issues (Joss S., 1998, Grundahl, J, 1995). The consensus conferences which followed used the Danish experience as a template among others, these are: the Dutch consensus conference on transgenic animals which took place in 1993, and on human genetics research in 1995 (Hamstra A., 1995; Mayer I., de Vries J. and Geurts J., 1995), the British conference on biotechnology which took place in 1994 (see Joss S., 1995), in the U.S.A. on the issue of *"Telecommunications and the Future of Democracy"* in 1997 (see Guston, David H., 1999/10/1), and the French one on GMOs in 1998 (see Boy D., Donnet-Kamel D. and Roqueplo P., 2000). The aim is to create a debate and to frame it in the broadest possible way in order to enlighten decision-makers on technical-scientific matters for which there are great uncertainties.

A few variations apart, consensus conferences have been organised in this manner. They are composed on the one hand of scientific experts and stake-holders – that is all people more or less concerned by the subject such as industries, non governmental associations, trade unions, consumer associations, political parties, etc. -, on the other hand, a random selection of directly or indirectly affected citizens. The aim is to have the widest diversity of opinions. Participants meet regularly together over several months, each session lasting a few hours. During the first sessions, citizens receive scientific-technical training from the experts in order to be able to participate in the debates. At the end of the training, the citizens select the themes they wish to discuss. During the following sessions, a few experts make a brief presentation on each theme and then they answer the questions asked by the citizens. At the conclusion of each session, the citizens withdraw and write a short report which is sent to the decision-makers.

Previously conducted consensus conferences seem to show that the public participation in technical-scientific decision-making is quite viable (see Guston, David H., 1999/10/1). The framing of the problem seem to be effectively wider: diverse values and interests as well as the complexity of the problem are taken into account – there is therefore a gain in output legitimacy. Furthermore, they make visible the various lobbies and include persons previously excluded before – thus reinforcing the input legitimacy. However, there is still a problem of input legitimacy in terms of the selected sample of the public who 'decide' for those who

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were not part of the process. Furthermore, the participants represent already constituted groups and this procedure does not allow the exploration and emergence of identities.

Citizens' jury operate in a similar way to conference consensus. The major difference is that this procedure deals with local issues and not with the problems a nation is facing as does the conference consensus process (See Crosby N., 1995, Armour A., 1995) However, in the case of *Gueugnon*, after the abandonment of the initial incineration plant project (*i.e.* after the end of the studied decision-making process), the *Conseil Général* (assembly of the *département*) decided to start the decision-making process again, resorting to 'action planning workshop' in the framework of the setting-up of the *Départemental* commission for the disposal of household and similar waste plan *(commission départementale pour le plan d'élimination des déchets des ordures ménagères)*. The NGOs participated to the elaboration of 12 scenarios of waste treatment. Indeed, they participated in all the meetings of the *commission départementale* together with the elected decision-makers and the administrative staff. They had the same possibilities to influence the decision-making as the elected decision-makers: they could bring their own knowledge, they could ask for the selection of certain experts, and they could question the expert which participated in the meetings.

I.2. No Public Engagement

When exchange of information between the public (at least the associations) and the public authority became difficult, associations undertook administrative or criminal actions in order to fight against the public authority project. This class of mechanism is considered as '***non-engagement***' since there is no '*flow of information*' between public authority and the public. Information is exchanged between a judge and the legal representatives of both parties, public authority on one hand, and associations on the other hand. The administrative actions concerned the procedural aspects of the decision-making process, or the non conformity of a facility concerning certain norms. As for criminal actions, they were undertaken in the cases in which an old generation incineration plant used to run. In these cases, the NGOs claim that the incineration plants did not respect the norms concerning emission of pollutants, and consequently that they put in danger the residents' health.

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I.3. Bottom-up Mechanisms

Most of the bottom-up public engagement mechanisms are similar to the top-down ones. The difference is that bottom-up mechanisms are sponsored by the public whereas top-down ones are sponsored by the public authorities.

Bottom-up Communication

Six types of bottom-up communication mechanisms can be differentiated. They have been labelled from *'type 1'*** to *'type 6'***. Demonstration, Petition and Protest letters sent to policy makers are the **bottom-up communication mechanisms of type 1****. They are the traditional communication mechanisms typically used as part of protestation plan which mainly target the public authorities. The information conveyed is very simple: opposition to the position of the public authorities. The aim of these mechanisms is to pressure the public authorities through non face-to-face actions. The representatives of the public aim to gain representativeness through an important number of participants. Because the arguments usually used during these protestations are of a slogan type, the discourse held may be considered without '*argumentation'*.

With the **type 2** mechanisms**, press release and opposition open letters published by the NGOs aim to publicise the opposition of the NGOs to the incineration plant project. The target is the larger public. In principle, it is possible that these mechanisms contain arguments, in this case, they are another type of mechanisms (see type 3**).

Type 3 mechanisms** are 'Association Information broadcast', that is, 'publicity' via a variety of (non FTF) media: newsletters/ Journal, newspaper, open Letters, press release, radio broadcast. These are the traditional communication mechanisms, through which the NGOs target a particular population (among the larger public) with set information. The target is the larger public, and the information consists in arguments which support the opposition to the public authorities' project. These mechanisms are similar to the top-down communication type 1.

Association exhibitions and association web sites are **type 4** bottom-up communication mechanisms**. These mechanisms are similar to the top-down communication mechanisms of type 3. The exhibitions used in the ten decision-making processes were sporadic actions in public places such as "*dégage l'emballage*" (no packaging anymore) and they took place in supermarkets. They were symbolic consciousness-raising actions. On a particular day, the organizers who were dressed in sandwich boards went to some

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supermarkets: just behind the cashdesk, they left all the packaging of the goods they had purchased.

Conferences and public meeting, **type 5** mechanisms**, were used a large amount by the NGOs. This class of mechanisms is similar to the top-down communication type 2. These mechanisms rely on the larger public to come to the information rather than vice versa. Information is communicated face-to-face by associations to those involved, and is variable, depending to some degree on what participants ask. In these meetings, the NGOs provide the (larger) public with alternative information. Roughly, the discourse is centred around the sanitary and environmental risks of incineration and around the alternative techniques. The aim of the NGOs is to bring the attention of the (larger) public to their cause. In public meetings the speaker is a member of the NGO, while in conferences he is an external member especially invited. This external member is endowed with some expertise in the field either of waste treatment, or of the sanitary and environmental impact on health and environment.

Bottom-up communication type 6** brings together newsletters, reports, or expertises, sent directly to policy-makers. Through written documents, these mechanisms are essentially ways of providing the public authorities with set alternative information. The aim is to change the mind of the public authorities.

Bottom-up Consultation

Bottom-up Consultation consists of requests for information made by the public to the public authority. This request shows the lack of top-down communication in the eyes of the NGOs. Two types of consultation mechanisms have been identified. **Type 1**** consists of the request of a meeting with the public authorities. Information is communicated face-to-face by public authorities to those involved and is variable, depending to some degree on what participants ask. The place of the meeting is generally provided by the NGOs or groups of interest. This class of mechanisms is similar to the top-down communication type 5**, the difference is the sponsor. The bottom-up consultation mechanisms type 2** consists of the request of documents: NGOs asked for written information to the public authorities.

Bottom-up Participation

The characteristics of the bottom-up participation mechanisms are identical to the top-down ones, only the sponsor differs. In the eleven decision-making processes, no bottom-up participation has been found. Bottom-up participation entails the engagement of the public authority in a participation mechanism whose it is not the sponsor. The absence of bottom-up

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mechanisms has two meanings: either the NGOs did not dare or think that it was possible to sponsor such mechanisms, or the public authority discouraged any thought to sponsor bottom-up mechanism. In the light of the actual top-down engagement, it is very likely that the groupings of *communes* are not keen on abandoning the organisation of the decision-making processes. The examples of bottom-up participation mechanisms are not in the field of decision-making but in the field of the research, with for example patient associations shaping the research and care agenda, or community-based research (see Epstein, Steven G, 1995a; Callon M. and Rabeharisoa V., 1999; and Bourret P.).

II. The Three key chronological stages

As I have stated in chapter 4, I have divided the decision-making processes in three key chronological stages according to the importance of the issues under discussion: '*framing'*, '*specifications'*, and '*realisation'*. In the ten cases, '*framing'* corresponds to the choice of the waste treatment technology, that is the choice of incineration, while '*specifications'* comprises the technical specifications of the incineration plant (capacity, types of furnace, etc.) and its location. Moreover, in this stage are also included the selection of the building company and of the operator through invitations to tender. The third stage, *'realisation'*, consists of the construction of the incineration plant.

For each of the ten decision-making processes, the three key chronological stages are defined through the identification of four key events. These key events are four decisions made by the public authorities: the grouping of *communes* or the *préfet*. The actual delimitation of the key chronological stages, that is, the definition of the four key chronological events, is not unproblematic. In the mess of the social reality, the decision-making processes are not all linear, that is the events do not always occurs in the same order. Moreover, the decision-making processes are riddled with slack periods during which nothing seems to happen, and which can last months and even years. So, concerning the 'slack periods' and the 'non linearity' a series of choices must be made in order to define the three chronological stages in the ten decision-making processes, making the decision-making processes comparable.

First, concerning the 'slack periods', the choice consists of their attribution either to the stage which ends or to the following stage which starts. Such choices must be made for the stage 1-stage 2, stage 2-stage 3, and stage3-stage 4 delimitations. The first stage, '*framing'*, starts with the decision of a grouping of *communes* to set up a waste treatment facility and

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ends with the choice of incineration as waste treatment technology. Then, a few months can elapse before the first meeting in which the discussions about the specifications start; I consider this first slack period as part of the second stage since the '*degree of manoeuvre*'[120] diminishes when the choice of a waste treatment technology is made. In other words, the second stage starts with the decision to adopt incineration as waste treatment technology. The second stage '*specifications'* ends with the granting by the *préfet* of the authorisation to operate. Indeed, in the request to operate addressed to the préfet, the grouping of *communes* and the operator have jointly proposed the final and complete specifications of the incineration plant. Subsequent substantial modifications of the incineration plant project would require a new authorisation to operate. Then, there is another slack period between the granting of the authorisation and the beginning of the construction. I consider this slack period as part of the third stage. Indeed, between the granting of the authorisation and beginning of the building, the public authorities do not modify substantially the project; the '*freedom of manoeuvre*' remains substantially the same. So the third stage *'realisation'* starts with the granting by the *préfet* of the authorisation to operate, and not with the actual beginning of the construction. The third stage, and in the same time the decision-making process, ends with the official opening of the incineration plant.

[120] I remind that '*degree of manoeuvre*' means the number and importance of the issues to be decided (see chapter 4, sub-section III.3 for further details about the key chronological stages)

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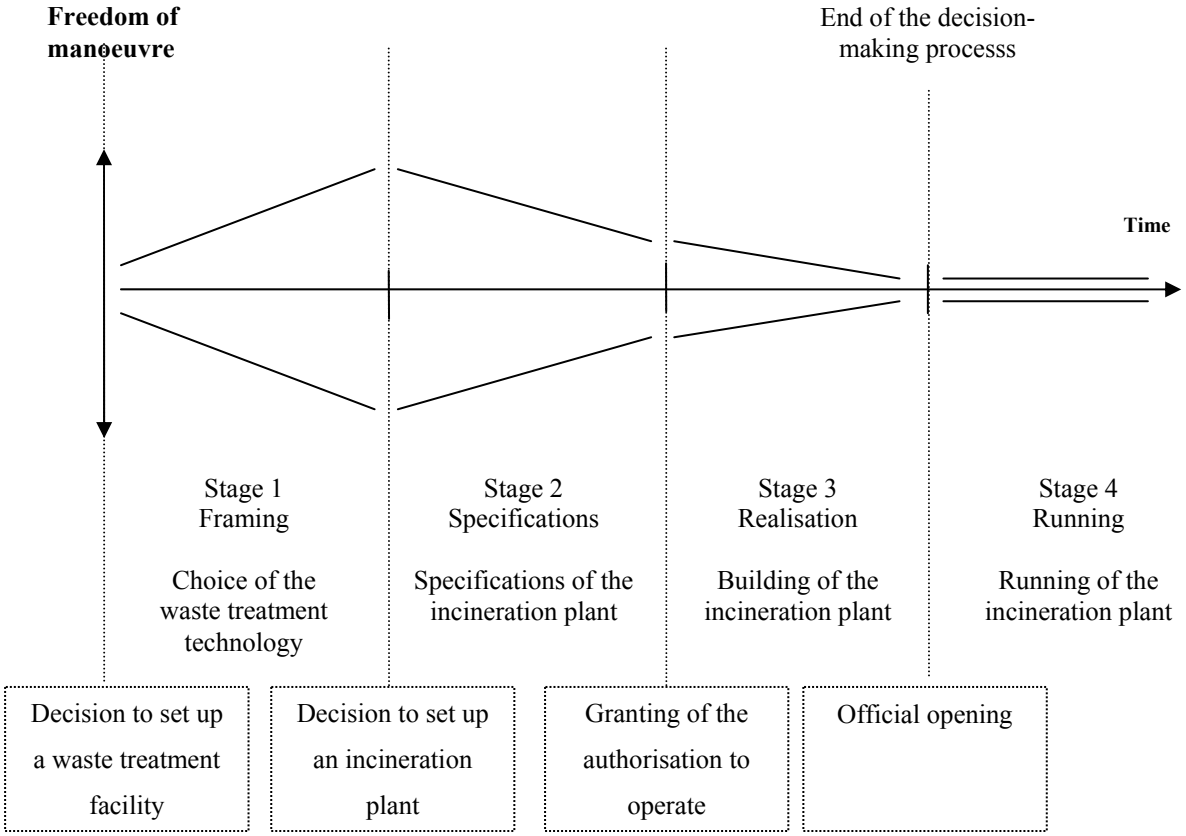
Figure 8. Definition of the three key chronological stages through four key events



Concerning the 'linear problem', in two cases the construction started before the granting of the authorisation by the *préfet* to operate.[121] Since the definition of the key chronological stages is made according to the '*freedom of manoeuvre*', I consider that the third stage *'realisation'* starts with the granting of the authorisation to operate by the *préfet.* Indeed, the decision of the *préfet* is more restrictive for the project than the beginning of the construction.

Seven decision-making processes ended by the official opening of the incineration plant and are thus made of three stages, while three ended during the second stage with the abandonment of the incineration plant project. These three decision-making processes are the one which ended in 2005: 1. *Gueugnon*, 2. *Angers*, and 3. *Thiviers*.

[121] See the appendix "The ten decision-making processes" for thick descriptions of each of the ten decision-making processes

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III. Actual Public Engagement and Political Will

The analysis of the actual public engagement and of the political will to engage the public is based on the charts of the number of public engagement initiatives in function of the three key chronological stages. Two series of charts have been drawn. The first series is made up of ten charts: there is one chart per decision-making process, and on each chart there are seven graphs, one for each of the seven classes of mechanisms. The second series is composed of seven charts: there is one chart per class of mechanisms, and on each charts there are ten graphs, one for each decision-making process. These charts and the details of their building can be found in the appendixes "Actual Public Engagement: Charts by Decision-Making processes", and "Actual Public Engagement: Charts by Class of Mechanisms". This section is composed of four sub-sections. The three first are respectively dedicated to the actual top-down engagement, no public engagement, and bottom-up engagement, while the last sub-section deals with the political will of the local decision-makers to engage the public.

III.1. Actual top-down mechanisms

Top-down communication

Communication mechanisms are the favourite public authorities' tools for the engagement of the public. In each of the ten decision-making processes, the public authority (grouping of *communes* in charge of the waste treatment) resorted to them. Among the five types of top-down communication mechanisms, the most used are the type 1* (above all newsletters and press releases) and the type 2* (public meetings); the others mechanisms were used in a marginal way.

According to the stage of the decision-making processes, the number of top-down communication initiatives varies a large amount (see the chart "Top-down Communication" in the appendix). In almost all but one cases, there is no top-down communication at all during the first stage, and in all the decision-making processes, the communication starts only once the choice of a waste treatment technology, that is incineration, is made. In the case of *Le Havre*, a little top-down communication was made during the first stage. But only three initiatives were organised: one letter to an NGO, one phone communication with an NGO, and one public meeting. Only the NGO *'Comité du quartier des Neiges',* NGO of the residents of an old generation incinerator was informed.

Three types of decision-making processes can be differentiated according to the top-down communication. In the first type (three cases: 6. *Le Havre*, 8. Villers-St-Paul, and 10.

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Guichainville), there is a peak of the number of communication initiatives during the second stage, the *'specifications'* stage. Then the communication decreases, and almost disappears during the *'realisation'* stage. In the second type (9. *Calce*, 10. *Vaux-le-Pénil*), the top-down communication constantly increases along the three stages. In the case of *Calce*, however, communication remains very low along the entire decision-making processes. The third type is composed of only of one case: 5. *Lasse*. In this case, there is no top-down communication during the decision-making process, but consultation and participation initiatives were sponsored by the public authority from the second stage onward. The last type brings together the three decision-making processes ended by the abandonment of the incineration plant project. In these three cases, top-down communication started during the *'specifications'* stage. Obviously, for these cases, there is no *'realisation'* stage.

Top-down consultation

The public authorities almost did not resort to consultation mechanisms (see the chart "top-down consultation" in the appendix). Indeed, even if four types of top-down consultation have been identified, they were actually used in only four out of the ten decision-making processes. In none of the decision-making process consultation was made during the first stage. The first consultation initiatives were sponsored during the second stage, after the waste treatment technique was already selected. Finally, in only one case (*Calce*) were consultation initiatives sponsored during the third stage.

Opinion surveys, and referendums, which are top-down consultation type 1* mechanisms, were each used once. A referendum was organised by one municipality (in the case of *Calce*) in order to decide about the hosting of the incineration plant. An initiative of type 2*, a consultative committee, was used only in the case of *Angers*. As for the type 4**, some top-down consultations of NGOs took place in the cases of *Angers* and *Lasse* in order to know the views of the NGOs concerning the incineration of waste. While in the case of *Lasse*, the public authority contacted national NGOs in order to gather their views on waste incineration, generally speaking, in the case of *Angers*, *Angers Loire Métropole* met the local environmental NGOs in order to know their view about the specific project. At last, *Angers Loire Métropole* was the only public authority to organise a large scale consultation of the residents resorting to public consultation meetings.

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Top-down participation

In the ten decision-making processes, the public authorities resorted little to top-down participation mechanisms (see the chart "Top-down Participation" in the appendix). In none of the decision-making process, a public participation initiative was sponsored during the first stage. Since it is compulsory, in all the decision-making processes the public authorities sponsored one public inquiry which is made of *registres d'enquête* (enquiry registers) on which the public can write down its opinions and suggestions, and individual meeting between the *commissaires enquêteurs* (enquiry commissioners) and the residents (on the demand of the residents). These two mechanisms are respectively type 4**, and 5** top-down participation mechanisms. By law, the public inquiry is realised very late in the decision-making process, at the end of the *'specifications'* stage, a few months before the beginning of the *'realisation'* stage, when everything has been decided in the details.

In four cases, the public authority contented itself with the public enquiry; the cases are: *3. Thiviers, 4. Arras, 2. Le Havre,* and *10. Guichainville*. In the six other decision-making processes, the public authorities resorted to a few non compulsory mechanisms. More precisely, in four cases (*5. Lasse, 9. Calce, 10. Villers-Saint-Paul,* and *11. Vaux-le-Pénil*), the grouping of *communes* sponsored a few non compulsory Local Commissions for Information and Monitoring (see chart "top-down participation" in the appendix). However, for three of these cases (*Calce, Villers-Saint-Paul,* and *Vaux-le-Pénil*), the first meeting took place when almost everything was already set, that is, toward the very end of the '*specifications'* stage, or during the *'realisation'* stage. Furthermore, in each of these cases, only three initiatives took place. Only in the case of *Lasse* a substantial series of seven commissions were organised from the beginning of the second stage onward and thus could have an impact on the outcome of the decision-making process.

In the case *1.Gueugnon*, there was an attempt to set up such a commission. However, the local NGOs refused to participate arguing that it would only have meant that they supported the incineration plant project.

At last, in the case of *Angers*, the grouping of *communes Angers Loire Métropole* made available some non compulsory *registres d'enquête* in the town halls of the municipalities members of the grouping of *communes*. Nevertheless, it is not clear whether these registers were rather consultation or participation mechanisms, since I could not identify precisely the kind of information delivered by the public authority. In the case of *Angers*, the grouping of *communes* had also the possibility to be in touch with the local NGOs through a Compulsory Local Commission for Information and Monitoring regularly organised for the existing old

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generation incineration plant. However, in the facts, this commission was not a place where the public authority and the NGOs debated about the new waste treatment facility. The situation was already very controversial; some administrative and criminal actions were undertaken about this existing incinerator.

III.2. No Public Engagement

In none of the decision-making process is there a situation of total absence of public engagement, with no mechanism at all. But some legal actions were undertaken by some NGOs. Some civil actions were undertaken in almost half of the cases: 2. *Angers, 3. Thiviers, 5. Lasse, 10. Villers-Saint- Paul,* and *11. Vaux-le-Pénil* (see the chart "Legal actions" in the appendix). These actions were about the compliance with the law of the authorisation to build, the authorisation to run, or of the *départemental* plan for the elimination of waste. In the case of *Angers*, such a legal action did not concern the new incineration plant project, but the authorisation to build for the old existing incineration plant (which officially opened in 1978, and which is still running in 2009), and its non compliance with the anti-pollution equipment norms. Criminal actions were undertaken in the cases of *Angers* and *Vaux-le-Pénil*, but they were not about the new incineration plant project, but about old generation incinerators and the hazard to health posed by their emissions of pollutants.

The administrative actions were undertaken during the second stage of the decision-making processes. That is, once the NGOs were informed about the incineration plant project; they tried to influence the outcome of the respective decision-making processes. As for the legal actions, since they are not linked to the new incineration plant project, but to an old generation existing incineration plant, it is difficult to identify a relationship between the time they were undertaken and the stage of the decision-making process.

III.3. Actual bottom-up Engagement

I succeeded in interviewing all the concerned NGOs excepted in the case of *Arras*. In this case, the only engaged NGO, Nord-Nature, answered very briefly to the interview. From this interview, the engagement of the NGO can be summarised as the participation in the compulsory Local Commissions for Information and Monitoring, after the opening of the facility. Furthermore according to the grouping of *communes SMAV*, there was no bottom-up engagement, and the residents were not much interested in the thermolysis facility project.

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Bottom-up communication

Among the six types of bottom-up communication mechanisms, the NGOs principally recoursed to the type 3** mechanisms, that is the traditional publicity (newsletters, press releases), and to the type 5** (Public meetings and public conferences), and to a lower extent to public protests (type 1**). Public meetings were used far more than conferences. Public meetings were held roughly on a monthly basis, while only a few conferences were organised. What is likely due to the fact that it is more complicated to organise public meetings with external speakers than with internal ones. About type 4**, the greatest part of the NGOs has set up a web site, whereas exhibitions were more rarely organised.

Newsletters, reports, or expertises directly sent policy-makers (type 6**) were very rarely used: these mechanisms were employed by the NGO *Collectif incinerà'tort (Angers)*. The aim of the initiatives was clearly to change the mind of the decision-makers through alternative expertises. To a lower extent, the NGO *CRITOM,* in the case of *Lasse*, also resorted to this type of mechanisms. At last, the type 2* (opposition association press release and opposition open letters) were not used that much.

With regard to the evolution along the decision-making processes, all the cases have in common that there was no bottom-up communication during the *'framing'* stage. This absence of communication is consistent with the fact that the incineration plant project were not publicised by the public authorities during the first stage. I have identified four types of decision-making processes according to the bottom-up communication (see chart "bottom-up communication"). The first type is composed of four cases (*5. Lasse, 9. Calce, 11. Vaux-le-Pénil, 10. Guichainville*). In these cases, there is a (small) peak of bottom-up communication toward the end of the *'specifications'* stage. This peak corresponds to the period of the public enquiry: through a more intensive communication directed at larger public, the NGOs tried to have an impact on the outcome of this enquiry. In the second group, bottom-up communication constantly increases along the decision-making process. But, there is only one case in this type, *8. Villers-St-Paul*. Once the building has started, it is very unlikely that bottom-communication has an impact on the outcome of the incineration plant project. In the third group, the NGOs did not organise any bottom-up communication initiative, these are the decision-making processes *'4. Arras',* and *'6. Le Havre'*. This lack of initiative shows that the NGOs were not that opposed to the incineration plant project. In the last group, the decision-making processes ended with the abandonment of the incineration plant project. In the case of *Gueugnon* but above all of *Angers, and Thiviers*, the NGOs communicated much more than in the other cases.

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Bottom-up consultation

Bottom-up consultation mechanisms can be found in half of the decision-making processes: *Angers, Thiviers, Lasse, Villers-Saint-Paul, Guichainville,* and *Vaux-le-Pénil* (see chart "Bottom-up Consultation"). In each of these cases, the number of requests (*i.e.* of bottom-up consultation initiatives) is quite low by comparison to the number of (bottom-up or top-down) communication initiatives: between one and five initiatives. In most, but not all, of the cases, the public authority answered to the request of the public.

III.4. Conclusion

Political will to engage the public

As we have seen in chapter 5, the public authorities have a lot of possibilities to engage the public, and few legal obligations. The constraints consist of the carrying out of a public inquiry toward the end of the second stage '*specifications'* and the creation of a Local Commission for Information and Monitoring once the incineration plant is running, that is, after the end of the decision-making process. Comparing the actual top-down public engagement with the legal framework, it appears that there was little political will to engage the public, and almost no will to make the public participate beyond what was legally mandatory. Since the legal obligations were very few, it can be argued that there was very little political will to make the public participate. Indeed, there was no top-down engagement (no communication, no consultation, and no participation) during the first stage ('*framing'* stage), when all options were open. Top-down public engagement started during the second stage, that is, after the key decision, the choice of incineration as waste treatment technology, was made. Furthermore, the top-down engagement predominantly consisted of communication with traditional mechanisms: newsletters, press releases, and (to a minor extent) public meetings. Consultation was almost inexistent in all but one case: in the case of *Angers* a substantial consultation was carried out through consultation public meetings, and enquiry registers during the second stage. As for participation, it started very late, toward the end of the second stage, when the '*degree of manoeuvre*' was almost equal to zero, that is, when almost everything was already decided. Top-down participation started with the carrying out of the compulsory public inquiry. Moreover, only in three cases did the public authority set up a Local Commission for Information and Monitoring toward the very end of the second-beginning of the third stage. Only in one case (5. *Lasse*) did the public authority

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start to sponsor meetings of a Local Commission for Information and Monitoring, at the middle of the second stage. The public authorities almost did not resort to the other public engagement mechanisms provided by the law: public referendum, district councils, consultative committees, and participation of residents and users to the life of the local services. In substance, it appears that the public authorities did not go much further than the provisions of law. If communication was late but rather substantive, participation and consultation was very late and very little. The public engagement recommended by Science Studies scholars (Wynne B., 1992; Fischer F., 1999; Weale A., 2001; Callon M., Lascoumes P. Barthe Y., 2001; Nowotny H., Scott P. Gibbons M., 2001; Nowotny H., 2003; Jasanoff S., 2003; Grundmann R. and Stehr N., 2003; Dietrich H., Schibeci R., 2003/10/1)[122] is far from being implemented in the local technical-scientific decision-making processes in France.

Three intertwined reasons may explain this lack of political will on the part of the local public authorities. A first hypothesis is habit: the local decision-makers are simply used to make decisions without the participation or consultation of the concerned public. They make the decisions following mandatory procedures of public involvement. In brief, they may be simply not aware that they have the possibility to involve the public. A second hypothesis is that the habits of making decision following the representative democracy make them mistrustful toward participatory democracy. They may not want to abandon a part of the power they obtained winning elections. Another aspect of this reason is the responsibility of the elected decision-makers: the decision made at the end of a participation process may not be in accordance with the point of view of the elected decision-makers while this decision will be part of their track record for future elections. A third reason may be that the procedures for public participation are unknown, and consequently decision-making processes involving the public may be perceived as risky. Local decision-makers may have some doubt about the outcome of such decision-making processes, will they succeed in making a decision shared by most of the public, and they may think that they are going to loose time. Moreover, it is not easy to set up a new type of decision-making process; they may not know how to organise public participation and consultation; they likely not have the requested internal competencies. Of course, these reasons can be combined. Moreover, I do not pretend to set up an exhaustive list of the reasons for this lack of political will. Further research would be

[122] See chapter 1

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necessary to fully explore and analyse the reasons of the local decision-makers of this lack of will to engage the public.

In order to increase top-down consultation and participation in environmental local decision-making processes two alternatives solution can be envisaged: promotion or legal obligation. In France, the state environmental agency ADEME is likely capable to make an efficient promotion thanks to its good knowledge of the local public environmental decision-making processes: it knows the local public authorities and their competences, and it is informed about the new projects. Moreover, since it already provides some technical advice and financial help to the local public authorities, ADEME is very likely positively perceived by the local decision-makers. Therefore, the latter are likely to heed the advice about major public participation made by ADEME. As the French national experience shows, with the setting up of the *Commission Nationale de Débat Public* in 2002, the other solution is to impose public participation by law. As I have already stated in chapter 5, *Commission Nationale de Débat Public* deals only with the environmental decision-making processes concerning the projects which are of national importance.

In both cases, the local public authorities need technical support to sponsor participation and consultation initiatives. This technical support could be provided by a public entity, as the *Commission Nationale de Débat Public* does, or by consulting firms, as is already the case concerning the technical studies of the projects.

A typology different from the one of Rowe and Frewer

Concerning top-down engagement mechanisms, to date the typology of Rowe and Frewer (2005) is very likely the most complete, gathering together the mechanisms studied in the Science Studies litterature. None of the highly participatory mechanisms have been used during the ten studied decision-making processes. I have not found any of the participation mechanisms classified in the typology of Rowe and Frewer (2005): I have not found any of popular highly participatory mechanisms: consensus conferences, citizens'juries, and action planning workshop (type 1); deliberative opinion poll, planning cells (type 3). I have not found the less known mechanisms either: town-meeting with voting (type 4); and negotiating rule making, and task force (type 2).

However, I have identified new top-down participation mechanisms and I have therefore supplemeted the typology of Rowe and Frewer. These mechanisms are also new types that Rowe and Frewer did not encounter: Local Commission for Information and Monitoring (type 3); enquiry register (type 4); and interview with *commissaires enquêteurs* (type 5).

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These mechanisms allow public participation, but they have a major drawback: in the cases studied they were sponsored too late in the decision-making processes. For effective participation, an initiative must be sponsored at the outset of the decision-making process, during the framing stage, not toward the end, when almost everything is already decided. Public inquiries are, in principle, a good participation mechanism: the dossiers, which precisely describe the project, allow the public to be fully informed and the *registres d'enquêtes* (enquiry registers) and individual interviews with *commissaires enquêteurs* (commissioners) enable the public to give its opinions, suggestions or counter-proposals. But public enquiries come too late in the decision-making processes; they take place when everything has already been decided. Another draw-back of the public enquiries, as they are actually organised, is that they took place in town halls, during the working hours. Thus the residents who are also workers had difficulties accessing the public inquiry. The other mechanism provided by law, the (Non Compulsory) Local Commission for Information and Monitoring could also be a good participation initiative. But they were organised very late in the decision-making processes, during the *'realisation'* stage, when everything was decided. Furthermore, the local NGOs (usually from one to three) were in minority: they were facing a multitude of representatives of the public authority (grouping of *communes*, municipality, state), and of the operator.

I have found only a few of the top-down consultation mechanisms listed by Rowe and Frewer (2005). I have encountered opinion poll, local referenda (type 1), and consultative comitte which are similar to the consultation document (type 2). But I have not found one of the most popular consultation mechanisms: the focus groups (type 4). I have not found some other mechanisms: survey and telepolling/voting (type 1); electronic consultation (interactive web-site), type 3; open space, study circle (type 5), and citizen's panel (type 6).

However, I have supplemented the typology mechanisms which are similar to type 4 and 5, that is, which have the same *'significant charateristics'*. These are: Consultation meeting with representatives of associations (type 4); and Consultation Public meeting (type 5)

To conclude, the top-down consultation and participation mechanisms encountered in this research are different from those listed in the typology of Rowe and Frewer. This research is based on French cases, while, as they indicate, the typology developed by Rowe and Frewer is mainly based on the mechanisms used in the Anglo-Saxon countries. The question which stems is why the French mechanisms are so different form the Anglo-Saxon ones? It is

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unlikely that the Anglo-Saxon mechanisms were not adapted to the French democracy. There is no reason why the mechanisms listed by Rowe and Frewer could not be applied in France. As a matter of fact the *Commission Nationale du Débat Public* resorted to some of these mechanisms, such as the focus groups. Concerning the compulsory participation mechanisms, it is plausible that the French legislators simply did not look that much toward the Anglo-Saxon experiences. As for the non-compulsory mechanisms, as we have seen the local public authorities studied in this research were obviously not at the leading edge of participation and consultation, and it was therefore unlikely that they sought innovative highly participary mechanisms used in the Anglo-Saxon countries.

Public will to engage in the decision-making processes

Bottom-up public engagement is the reaction of a part of the residents to the incineration plant project and to the way public authorities engaged the public in the decision-making processes. As soon as the incineration plant was decided and publicised, that is, at the beginning of the *'specifications'* stage, the mobilisation of the NGOs started. The NGOs principally resorted to communication mechanisms. This bottom-up communication consisted of protests (demonstration and petitions), and of information through public meetings, conferences and newsletters. Bottom-up consultation, which reflects the need for information of the NGOs, was used in half of the cases, but in each case the number of initiatives is low. In most of the cases, the public authorities followed up these requests. As for bottom-up participation, it was not used in any of the eleven cases. This absence of bottom-up participation is not easy to interpret: did the NGO think that there was no way to obtain the participation of the public authority in such mechanisms? Finally, legal actions, which are *'no public engagement'* mechanisms, were mainly undertaken toward the end of the decision-making process, just before the *'realisation'* stage; they were the last attempts of the NGO to stop the incineration plant projects.

A question which has not been dealt by Science Studies scholars concern the public willingness to engage in the decision-making processes. This public willingness is fundamental for the organisation of participation or consultation mechanisms. By definition without public willingness to participate, it is not possible to sponsor consultation or participation initiatives. And the discourse of the science studies scholars about the public engagement to solve the problem of traditional scientific expertise (see chapter 1) losts its

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significance. Consequently, the decision-makers can make their decisions as they used to do, limiting public engagement to information. In the ten cases studied, the bottom-up engagement shows that the public was willing to engage in the decision-making processes. As we will see in chapter 9, most of them searched for information about the alternative waste treatment technologies.

Therefore, the first thing to do before thinking about sponsoring public participation or consultation is to assess the impact of the project on the public opinion. Doing so, it is possible to evaluate the possible degree of controversy of the decision-making process. Such an assessment can be done for example comparing the project with previous similar ones. For example, in the light of this research, it appears that the setting up of a waste treatment facility, or at least of a waste incinerator, is very likely to be controversial. Specifities of the concerned territory and population should be taken into account. In the case of waste treatment facilities, for example, specificities are, among others: presence of an old generation incineration plant, existing NGOs, socio-economical level of the concerned residents, specific activities around the site (schools, hospital, agriculture, etc.). Another solution to assess the impact of a project on the public opinion is to carry out surveys. These two solutions do not exclude each other, and they could be combined.

IV. Impact of the Public Engagement on the Decision-Making processes

In order to evaluate the impact of the public engagement on the decision-making processes, I confront the actual public engagement with the outcome on one hand, and with the degree of controversy on the other. The actual public engagement has been drawn in the section II of this chapter. The outcomes (realisation/abandonment) of the decision-making processes can be found in the table 16 in the appendix "The Ten Decision-Making Processes". As for the degree of controversy, they are established in sub-section IV.1 below.

In this section, I provide thus a typology of the decision-making processes according to their degree of controversy. Then I assess the impact of the top-down and of the bottom-up public engagement on the degree of controversy, and on the outcome of the decision-making processes.

IV.1. Degree of Controversy of the Ten Decision-Making Processes

As I have stated in chapter 4, section IV, I define the degree of controversy of the decision-making processes through four variables: *'legal action'*, '*ad hoc* NGO', '*bottom-up*

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communication initiatives', and '*public protests*'. But this definition can work only if the standard deviation of the variables *'bottom-up communication initiatives'* and *'public protests'* are both high. If not, it is difficult to differentiate the degree of controversy. For the 10 studied, the mean of the number of bottom-up communication initiatives cases is A=17.1, and the mean of public protests is A' = 3.6, while the respective standard deviation are high: respectively $\sigma = 16.7$, and $\sigma' = 2.9$. In other words the data points are far from the mean. So it is possible to apply the definition of the degree of controversy through four variables to the ten decision-making processes. The states of the four variables of each decision-making process are listed in table 6 below.

Table 6. Decision-making processes listed with the states of their variables

Case	Legal Action High (Present , X))/ Low (Absent , 0)	Type of NGO *Ad hoc* NGOs High (Present , X))/ Low (Absent , 0)	Level of bottom-up communication Initiatives (Number of initiatives Ni) High (Ni≥17) /Low (Ni<17) σ = 16,7	Level of public protest Initiatives (Number of initiatives Ni') High (Ni'≥3 , 5)/Low (Ni'<3,5) σ' =	Degree of Controversy	Degree of Controversy (simplified version)
1. Gueugnon	0 (Low)	X (High)	High (17)	Low (2)	Moderate	Mainly Controversial
2. Angers	X (High)	X (High)	High (40)	High (6)	High	Mainly controversial
3. Thiviers	X(High)	X (High)	High (46)	High (5)	High	Mainly controversial
4. Arras	0 (Low)	0 (Low)	Low (0)	Low (0)	Non Controversial	Mainly Not Controversial
5. Lasse	X(High)	X (High)	Low (10)	Low (1)	Moderate	Mainly controversial
6. Saint Jean de Folleville (Le Havre)	0 (Low)	0 (Low)	Low (0)	Low (0)	Non Controversial	Mainly Not Controversial
~~*7. Nîmes*~~	~~N.D.A.~~	~~X (High)~~	~~N.D.A.~~[1]	~~N.D.A.~~	~~N.D.A.~~	~~N.D.A.~~
8. Villers-Saint-Paul	X(High)	X (High)	High (33)	High (6)	High	Mainly controversial
9. Calce	0 (Low)	X (High)	Low (5)	Low (2)	Slightly	Mainly Not Controversial
10. Guichainville (Evreux)	0 (Low)	0 (Low)	Low (7)	High (7)	Slightly	Mainly Not Controversial
11. Vaux-le-Pénil	X(High)	X (High)	Low (14)	High (7)	High	Mainly Not Controversial

[1] No Data Available

Four decision-making processes are highly controversial, two moderately, two slightly, and two are non-controversial, and there is no *'almost controversial'* decision-making process. In other words, using the simplified categories, six decision-making processes are mainly controversial while four are mainly not controversial. The decision-making processes are clustered according to their degree of controversy in table 7 below.

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Table 7. Degrees of controversy of the ten decision-making processes

Classes of Controversy		Characteristics		Cases
Mainly controversial	**Highly Controversial**	- Legal Action - Two or three out of the three other variables (especially created NGO, Bottom-up Communication, Public Protests) are in a 'high' state	Or - No Legal Action - All the three other variables (especially created NGO, Bottom-up Communication, and Public Protests) are in a 'high' state	2. *Angers* 3. *Thiviers* 8. *Villers-Saint-Paul* 11. *Vaux-le-Pénil*
	Moderately Controversial	- Legal Action - One out of the three other variables (especially created NGO, Bottom-up Communication, and Public Protests) is in a 'high' state	Or - No Legal Action - Two out of the three other variables (especially created NGO, Bottom-up Communication, or Public Protests) are in a 'high' state	1. *Gueugnon* 5. *Lasse*
Mainly not controversial	**Slightly Controversial**	- Legal Action - None of the three other variables is in a 'high' state	Or - No Legal Action - One of the three other variables (especially created NGO, Bottom-up Communication, or Public Protests) is in a 'high' state.	9. *Calce* 10. *Guichainville*
	Almost not controversial	- No Legal Action - The three other variables are in a 'low' state, but the number of bottom-up communication initiatives and the number of public protests are not both be equal to zero, (See the non controversial type)		No case
	Non controversial	- No legal action - No especially created NGO - No bottom-up communication at all - No public protest at all		4. *Arras* 6. *Le Havre*

IV.2. Impact of the Top-Down Public Engagement on the Decision-Making Processes

As I have shown in the section I of this chapter, top-down public engagement consisted mainly of a late communication and of a very late and little participation. Only in two cases (*Angers*, and *Lasse*), the public authority sponsored substantial non compulsory consultation and participation initiatives from the second stage onwards. Because of this lack of variety in the top-down public engagement, it is not possible to assess the impact of the top-down engagement on the degree of controversy and on the outcome of the ten decision-making processes. However, it is possible to make some hypotheses based on the cases of *Lasse* and *Angers*. In the case of *Lasse*, it is possible that the top-down participation and consultation sponsored from the beginning of the second stage onwards limited the discontent of the residents. Indeed, at the beginning of the second stage, the decision-making process of *Lasse* had the characteristics to become 'highly controversial' (creation of an '*ad hoc'* NGO, legal actions undertaken by this NGO), and finally the low level of bottom-up communication during the second and third stage made the decision-making process only 'moderately

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controversial'. In fact, a series of requests of the residents has been taken into account during the participation initiatives. In other words, the top-down participation has had an impact on the outcome of the decision-making process, not on the realisation-non realisation of the incineration plant project, but the initial project has been modified: the site has been moved in order not to make the lorries not going through the center of the village, and extra monitoring of the functioning of the incinerator have been set up to answer to the worries concerning the emission of pollutants and the health hazards posed by the dioxins. More precisely, the mixed syndicate decided to monitor the functioning of the incinerator, and not to leave the monitoring only to the operating company, as it is usually done in France. In facts, the mixed syndicate set up its offices within the structure of the incineration plant, it monitors all the wastes which enter the incineration plant (origin, type, weight), and it continuously monitors the emission of pollutants through its own monitoring center. Moreover again upon the request of certain residents, the mixed syndicate set up extra monitoring system of the emission of pollutant: a system of semi-continuous monitoring of the emission of dioxins and a continuous measurement of other molecules such as acids.[123]

Conversely, in the case of *Angers*, the sponsoring of numerous top-down consultation initiatives during the second stage did not diminish the degree of controversy. The NGO '*ad hoc*' *Collectif Inciner'àtort* claimed that in spite of the top-down consultation, the mobilisation of the NGO should not diminish, that is, the members of the NGO should participate to the consultation and in the meantime continue to sponsor bottom-up engagement mechanisms (interview N°3). In fact, the NGO continued its mobilisation and sponsored numerous bottom-up communication initiatives, mainly public meetings and the publication of a newsletter. Finally, the public authority *Angers Loire Métropole* abandoned the incineration plant project, and selected the mechanical-biological sorting as waste treatment technology. So, in this case, the top-down consultation did not diminish the mobilisation of the NGO, and thus the degree of controversy.

IV.3. Impact of the Bottom-Up Public Engagement on the Decision-Making Processes

As I have already stated, it is not possible to asses the impact of the bottom-up engagement on the degree of controversy, since the latter is defined by the former. But, it is in principle possible to evaluate the impact of the bottom-up engagement on the outcome of the decision-

[123] See the appendix "the ten decision-making processes" for more details about the decision-making process of Angers.

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making processes and on the top-down engagement. Since bottom-up and top-down consultation and participation are both low, the analysis is based on the communication engagement (top-down and bottom-up).

At first sight, it seems that the bottom-up engagement had little impact on the realisation or abandonment of the incineration plant projects. Indeed, the decision-making processes with a high bottom-up engagement, ended indifferently by the abandonment (1. *Gueugnon*, 2. *Angers*, 3. *Thiviers*) or by the completion (5. *Lasse*, 8. *Villers-Saint-Paul*, 11. *Vaux-le-Pénil*) of the incineration plant projects. However, looking at the evolution of the engagement along the three stages, it is possible to propose some hypotheses (see the charts in the appendix). The three cases in which the incineration plant project was abandoned (1. *Gueugnon*, 2. *Angers*, 3. *Thiviers*) are the only cases in which there is a very high level of bottom-up communication during the second stage (see appendix chart "bottom-up communication"). Furthermore, in these cases the level of bottom-up communication is clearly higher than the level of top-down communication during the second stage (see the appendix "charts by case"). Conversely, the decision-making processes which ended with the opening of the incineration plants are characterised, during the second stage, by a rather low bottom-up communication and by a top-down communication superior to the bottom-up communication, excepted in the cases 5. *Lasse*, and 10. *Guichainville*. However, in the case of *Lasse*, a substantial top-down participation was sponsored during the second stage, and thus compensated the low level of communication. Moreover, in the case of *Villers-Saint-Paul*, the NGOs sponsored numerous bottom-up communication initiatives, but they came very late in the decision-making process, during the third stage, that is, during the building of the incineration plant. So, it is likely that a high level of bottom-up communication superior to the top-down communication, led to the abandonment of the incineration plant project, but this bottom-up engagement must take place before the third stage. From the decision-making processes studied, it is not possible to know what makes the difference: the high level of bottom-up communication *per se*, or the fact that it has not been matched by a similar lever of top-down communication.

As for the decision-making processes that were slightly or not controversial, they all ended with the opening of the incineration plant (4. *Arras*, 6. *Le Havre*, 9. *Calce*, 10. *Guichainville*). Therefore, in case of low bottom-up engagement, it is likely that the decision-making process ends with the opening of the incineration plant.

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To conclude, it is likely that an important bottom-up engagement may impact the outcome decision-making processes if there is a high level of bottom-up communication before the beginning of the third stage, that is, before the beginning of the realisation of the project.

Impact of the bottom-up engagement on the top-down engagement

As we saw in section III of this chapter, in the ten decision-making processes the bottom-up engagement started during the second stage. So the implementation of the evaluation of the impact of the bottom-up engagement on the top-down engagement consists of the evaluation of the impact of the bottom-up engagement during the second stage on the top-down engagement during the third stage. The public authorities could begin to respond to the NGOs' initiatives actions already at the second stage. However, I cannot evaluate this due to the time resolution of my chronological description of the decision-making process, that is, due to the definition of three key chronological stages. From the data collected, it is not possible to know the chronological order of the top-down and bottom-up initiatives respectively within the period of the second stage; I can only state that the initiatives took place during the second stage. Consequently, it is necessary to select the decision-making processes for which there is a third stage, that is, the decision-making processes which ended with the opening of the incineration plant. Six cases match these criteria, these are: 4. *Arras*, 6. *Le Havre*, 8. *Villers-Saint-Paul*, 9. *Calce*, 10. *Guichainville*, and 11. *Vaux-le-Pénil*. Even if it ended with the opening of the incineration plant, the case of *Lasse* is excluded from this selection because the public authority sponsored some participation initiatives during the second stage. In this case it is thus not possible to evaluate the impact of the bottom-up engagement on the top-down participation since the public authority was keen on organising top-down participation already during the second stage.

In four cases (8. *Villers-Saint-Paul*, 9. *Calce*, 10. *Guichainville*, and 11. *Vaux-le-Pénil*), there was some bottom-up communication during the second stage, whereas in two cases (4. *Arras*, 6. *Le Havre*), there was no bottom-up engagement during the second stage. As for the top-down participation during the third stage, in the four first decision-making processes, some top-down participation initiatives were sponsored, whereas in the two others it was not the case (see the charts "top-down participation" and "bottom-up participation" in the appendix). It is thus likely that the bottom-up communication during the second stage led to the sponsoring of top-down participation during the third stage.

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IV.4. Conclusion

Concerning the degree of controversy in almost all the decision-making processes, at least one NGO stood against the incinerator plant project. More precisely, six were mainly controversial (four highly, two moderately) while four were mainly not controversial (two almost non-controversial, two non controversial). Because of the lack of consultation and participation initiatives sponsored by the public authorities, it has not been possible to assess the impact of the top-down engagement on the degree of controversy and on the outcome of the ten decision-making processes. I can only present two contrasting decision-making processes in which there was respectively participation and consultation. In one case, the substantial top-down participation possibly limited the discontent of the residents: the public authority modified the initial plant project according to some requests of the residents. On the contrary, in the other case the consultation did not diminish the mobilisation of the local NGO which continued to sponsor many communication initiatives, and the decision-making process was finally highly controversial. Since top-down participation is rather rare in the local decision-making processes, in future research it would be better to start with selecting highly participatory decision-making processes, and then search for comparable non participatory decision-making processes.

As for the impact of the bottom-up engagement, I cannot draw any strong conclusions because of the relatively small number of cases. However some grounded hypotheses can be made. First, it is likely that an important bottom-communication during the second stage, superior to the top-down communication, contributed to the abandonment of the incineration plant projects. Moreover, it is likely that the sponsoring of bottom-up communication initiatives during the second stage of the decision-making processes entailed the sponsoring of top-down participation initiatives during the third stage.

Until now, including this research, studies have focused on single mechanisms. On one hand, there are the studies which focus on a unique participation mechanism, such as consensus conferences (see for example: Lezaun J., Soneryd L., 2007/7/1Blok A., 2007/4/1Seifert F., 2006/1/1Condit C. M., Parrott R. Harris T. M., 2002/10/1Einsiedel E., Jelsoe E. Breck T., 2001/1/1). On the other hand, as in the typology developed by Rowe and Frewer (2005), or the evaluation of mechanism made by Renn and al. (1995), various mechanisms are studied, but separately. In this research, I have first developed a typology; I have therefore dealt with the mechanisms separately. In a second step, I have attempted to deal with all the mechanisms used during the entire decision-making processes, but the

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evaluation was mainly quantitative. From this research, it appears that the point in time when an initiative is sponsored is fundamental. But above all, it appears that a more global evaluation is necessary: rather than assessing the single mechanisms, it is necessary to study systems of public engagement mechanisms, that is, plans of public engagement which combine public engagement initiatives at the various stages of the decision-making processes. To make such an analysis, the '*key chronological stages*' combined with the '*significant characteristics*' are likely to be helpful.

It is likely that an efficient plan of public engagement should combine the three classes of mechanisms. Such a plan should start with a large publicity of the project, traditional information mechanisms such as newsletters and press releases are likely to work well. In the meantime, an evaluation should be made of the impact of the project on the public opinion in order to evaluate the public willingness to engage in the decision-making process. If there is no public willingness, information initiatives are likely to be sufficient; there would probably be few participants to consultation or participation initiatives.

In case of public willingness to engage, the sponsoring of participation or consultation initiatives should be considered. The framing stage is very likely to be the key stage. As we have seen in the cases studied, when they selected incineration, the grouping of *communes* underevaluated the importance for the public of the sanitary risks issue. Therefore, the first initiatives should enable the inclusion of the public concerns in the framing of the project. They can be consultation or participation initiatives; the main points are that the mode of response of the public should be open in order to allow the emergence of the various public concerns, and that the public selection must be as large as possible. Mechanisms such as enquiry registers, interactive web sites, consultation public meetings and individual meetings with *commissaires enquêteurs* have the required characterics. Moreover, these first initiatives, and above all the public meetings (which group together various people) are likely to allow the emergence of new identities, that is the emergence of new groups of residents which will likely engage in the decision-making processes (Callon M., Lascoumes P. Barthe Y., 2001).

Then, the various solutions or scenarios of the project could be studied with small groups of participants, resorting to highly participatory mechanisms such as action planning workshops which have as main characteristics a controlled participant selection method, a flexible input of information, an open mode of reponse, a facilitation of information elicitation, face-to-face, and an unstructured facilitation of aggregation. In the light of this research, it seems that local NGOs are likely to be very engaged participants. In order to gain further (input) legitimacy, the choice of the solution could be settled with a large scale

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consultation mechanisms, that is, type 1 consultation mechanisms: referendum, opinion poll, survey, or telepolling/voting. It is likely that the second stage, the '*specification*' stage, would interest less the public because almost no important issues are under discussion. A few initiatives such as planning workshops or Local Commission for Information and Monitoring with the participation of some selected members, such as the local NGOs, are likely to be sufficient.

Finally, during the '*building*' stage, there is almost nothing to be decided. Therefore, mere information is probably sufficient. All along the decision-making process, information given to the entire population and not only to the participants is necessary. The residents who do not participate are likely interested in being informed about the project, its evolution, and about the consultation and participation initiatives sponsored. The delivered information gives them the possibility to engage in the already begun decision-making process and ensure more transparency about the way the decision is actually made.

Of course, this plan is only a quick outline and is therefore schematic. It should be first developed and refined from a theoretical point of view, considering the possible impact of the successive mechanisms on the degree of controversy of decision-making processes. This evaluation should be based on the '*six siginificant characteristics*' of the mechanisms and should take into account the three '*key chronological stages*'. A series of alternative plans could be set up, notably according to the nature of the project and of the population concerned. Moreover, it is likely that an engagement plan should be flexible in order to adapt to the evolution, which may be unexpected, of the decision-making process and more precisely of the reactions of the public. Such plans should be used as hypotheses to be tested through a new empirical research. In order to implement such plans, collaborations with consultancy firms dealing with participation or with grouping of *communes* should be considered.

By the way, since participation is likely to spread in the future, it would be interesting to set up a data base of the decision-making processes which resorts to top-down consultation or participation mechanisms. Such a database would notably facilitate the evaluation of the impact of these classes of mechanisms on the degree of controversy of the decision-making processes.

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PART III

PUBLIC MOBILISATION
OF
SCIENTIFIC EXPERTISE

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INTRODUCTION

As I have stated in chapter 1, many Science Studies scholars agree that public engagement is a solution to the crisis of traditional scientific expertise. While in part II I have analysed the actual public engagement in ten decision-making processes for the setting up of incineration plants, in this third part, I deal with the mobilisation of scientific expertise by the local NGOs in these 10 decision-making processes.

The purpose of the 10 decision-making processes is to choose a technology for the treatment of waste. In the first part, I have developed an analysis of the public engagement around the concept of '*flow of information*' between the public authorities and the public. The information put forward by the public authorities can be divided into three main categories: economic, administrative, and technical. Economic information mostly concerns the costs: such as the amount of the initial investment, the cost of the maintenance, the incomes coming from the sale of the energy produced by incineration, or the number of jobs created. A key economic element is the cost for the treatment of each tonne of waste. Administrative issues consist mainly of the legal status of the entity which will operate the facility: outsourcing, or public company under local government control. As we have seen in part II, the technical issues under discussion change during the decision-making processes. In the first stage, the issue at stake is the choice of the waste treatment technology: incineration, mechanical-biological sorting, methanisation, etc. In the 10 decision-making processes, incineration has been selected. It is likely that the reliability of the technology has played a role in these choices. Indeed, while the novel alternative technologies such as pyrolisis or mechanical biological sorting has had had limited experience in treating municipal waste, incineration is a proven technology, both from a technological and economical point of view. During the

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second stage, the choices concern the specification of the incineration plant, such as the type of and number of furnaces, the capacity of treatment, and the selection of a site (made according to technical criteria such as the accessibility for lorries or for trains). But during the second stage, the NGOs engaged in the decision-making processes, and they have brought new focuses: the environmental and sanitary hazards posed by incineration. As I have shown in chapter 3, the main motivation for the engagement of the NGOs is the dioxins: the local NGOS are worried by the environmental and health hazards posed by the dioxins emitted by incineration plants. Since uncertainties concerning the impact of dioxins on the environment and on health can only be cleared up by science it is likely that the local NGOs search for information through the mobilisation of scientific expertise. To sum up, even if the selected '*technical-scientific*' decision-making processes[124] are about the choice of a technology (incineration), scientific expertise (about dioxins) is likely to be central for the NGOs.[125]

In this part, I intend to evaluate the extent to which the local NGOs resorted (or not) to scientific expertise, that is, I intend to answer the second set of three research questions I established in chapter 1.

This third part constitutes three chapters. Chapter 7 sets up the theoretical framework, while chapter 8 exposes the methodology and attempts to answer the research questions: "4. To what extent did the NGOs seek for scientific expertise? When they did not, what are the reasons they invoke?", and "5. When they sought for scientific expertise, what are the sources they selected, and thus what are the sources the NGOs trust?" Finally, chapter 9 intends to answer the research question which deals with the use of scientific knowledge in the discourses of the public: "6. Is scientific knowledge a key argument in the discourses of the NGOs; what are the other types of arguments that the public employs to strengthen their position?"

Let us introduce first the molecules which are at the core of the controversies, dioxins: their chemical structure, the way they can be measured out, their effects on human health, the exposure of the population, the types of studies which can be set up to measure the sanitary

[124] It is worthwhile remembering here that the decision-making processes for the setting up of incineration plants are '*technical-scientific*', that is, they are "decision-making at those points where science and technology intersect with the political domain because the issues are of visible relevance to the public: should you eat British beef, prefer nuclear power to coal-fired power stations, want a quarry in your village, accept the safety of anti-misting kerosene as an airplane fuel, vote for politicians who believe in human cloning, support the Kyoto agreement, and so forth" (Collins H.M. and Evans R., 2002, p. 236).

[125] According to the interviewed NGOs, excepted for one case, the public authorities did not consider the impact on health and on the environment of incineration. These issues were brought in the decision-making processes by the NGOs.

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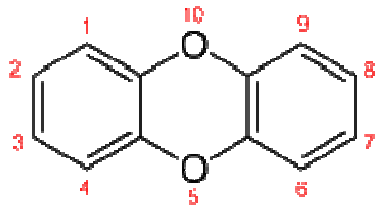
impact of a household waste incinerator, and finally what was the state of scientific knowledge concerning the link dioxins-municipal solid waste incinerators at the time of the ten decision-making processes.[126]

What Are Dioxins?

The term "Dioxins" refers to a group of chemical compounds that share certain chemical structures (two benzo- groups fused onto a *p*-dioxin ring, see figure below) and biological characteristics. Several hundred of these compounds exist and are members of three closely related families: the chlorinated dibenzo-p-dioxins (PCDDs, 75 different molecules), chlorinated dibenzofurans (PCDFs), also called Furans (125 different molecules), and certain polychlorinated biphenyls (PCBs). Sometimes the term dioxin is also used to refer to the most studied and one of the most toxic dioxins, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). CDDs and CDFs are not created intentionally, but are produced inadvertently by a number of human activities. Natural processes also produce CDDs and CDFs. PCBs are manufactured products. Dioxins are formed as a result of combustion processes such as commercial or municipal waste incineration and from burning fuels (like wood, coal or oil).



The skeletal formula and substitute numbering scheme of dibenzo-p-dioxin, the p*AREN*t compound of PCCDs. The variety of PCCDs is due to the multiple possible positions of chlorine atoms on this skeletal.

Health Effects

Dioxins bio accumulate in humans and wildlife due to their lipophilic properties, and are known teratogens, mutagens, and suspected human carcinogens.[127] Studies have shown that

[126] Sources for the writing down of the introduction of dioxins:
Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2005
Agence Française de Sécurité Sanitaire de l'Environnement et du Travail, 2007
Interagency Working Group (Group of U.S. Federal Agencies), 2007

[127] A 'teratogen' is an agent that interferes with normal embryonic development: alcohol or thalidomide or X-rays or rubella are examples.
A 'mutagen' is an agent (physical or environmental) that can induce a genetic mutation or can increase the rate of mutation.
A 'carcinogen' is a substance that produces cancer.

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exposure to dioxins at high enough doses may cause a number of adverse health effects. Because dioxins from natural and anthropogenic sources have been widely distributed throughout the environment since the early 1900's (and before), almost every living creature, including humans, has been exposed to dioxins. The health effects associated with dioxins depend on a variety of factors including: the level of exposure, and how long and how often. Because dioxins are so widespread, we all have some level of them in our bodies.

The most common health effect in people exposed to large doses of dioxins is chloracne. Chloracne cases have typically been the result of accidents or significant contamination events. Chloracne is a severe skin disease with acne-like lesions that occur mainly on the face and upper body. Other effects of significant exposure to dioxins include skin rashes, skin discoloration, excessive body hair, and possibly mild liver damage. Several studies suggest that the workers exposed to high levels of dioxins at their workplace over many years have an increased risk of cancer. Animal studies have also shown an increased risk of cancer from long-term exposure to dioxins. Finally, based on data from animal studies, there is some concern that the exposure to low levels of dioxins over long periods (or high level exposures at sensitive times) might result in reproductive or developmental effects.

Concerning incineration plants, the main concern over health effects of dioxins for the residents is the risk of cancer in adults, and in minor extent the reproductive and developmental effects. Usually, the residents are exposed to rather low levels of dioxins (by comparison to the accident of Seveso) over many years. However, as in the case of Gilly-sur-Isère, some incinerators may run without respecting the norms of emission of dioxins, releasing huge quantities of dioxins.

Diffusion in the Environment

After they are created, dioxins spread into all the mediums of the environment: water, air, soil, and sediments. Dioxins decompose very slowly in the environment. For example, the half-life[128] in soils is estimated at around 10 years (7 years in the human body). When released into the air, dioxins can be deposited on soils and plants and taken up by animals and aquatic organisms. The lipophilic properties of dioxins[129] explain that they may be concentrated in the food chain so that animals have higher concentrations than plants, water,

[128] The half-life of a quantity whose value decreases with time is the interval required for the quantity to decay to half of its initial value.
[129] In other words, dioxins tend to accumulate into fat.

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soil, or sediments. Dioxins accumulate in the food containing a lot of fat such as fish, shellfish, milk, or eggs. Dioxins are little soluble in water. When dioxins are released into water, they tend to settle into sediments where they can be further transported or ingested by fish and other aquatic organisms. Because of a low capacity of transfer towards vegetal tissues, vegetal fats are less contaminated.

In the ten decision-making processes, the main concern for the NGOs was the dioxins emitted by the chimneys: dioxins are also present in the clinkers, which are dumped in specific landfills, but the local NGOs were less interested by this issue. Dioxins are released in the atmosphere, they come down on the soils in a range of a few kilometres around the facility, and then through the food chain, animals and animal produces (meat, eggs and cow's milk) are contaminated.

Exposure of the Population

Although dioxins are an environmental contaminant, exposure is mainly a result of their accumulation in animal fats. More than 90 % of human dioxin exposure is due to foodstuffs. Foodstuffs of animal origin normally contribute to approximately 80 % of overall contact. The dioxin burden in animals derives mainly from their feeding stuffs. Therefore feeding stuffs and soils raise concerns as potential sources of dioxins for animals. Small amounts of exposure occur from breathing air containing trace amounts of dioxins on particles and in vapour form, from inadvertent ingestion of soil containing dioxins, and from absorption through the skin contacting air, soil, or water containing minute levels.

The residents surrounding incineration plants are thus mainly exposed through the consumption of local foodstuffs: above all eggs, cow's milk, meat, and in a minor extent vegetables. The residents are much less likely to be contaminated through breathing air.

Maximum Levels of Dioxins in Foodstuffs Reference Doses and Reference Concentrations

European provisions impose maximal contents of dioxins in certain categories of foodstuffs, in order to reduce the global exposure of the population, and to prevent from a high exposure in case of punctual pollution. The Council regulation (EC) No 2375/2001 of 29 November 2001 sets maximum levels of PCDD and PCDF per gram of fat contained in

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various products (meat, fish, milk, milk products, eggs, oils and fat). They are expressed in equivalent toxic equivalent quantity (TEQ).[130]

Reference Doses and Reference Concentrations

Reference Dose (RfD) and Reference Concentration (RfC) are toxicological indicators which enables to qualify or quantify a risk for human health. They establish the relationship between a toxic substance and the occurrence of an undesirable sanitary effect. They are set up by international organisations such as the World Health Organisation or by national structures such as the U.S. Environmental Protection Agency. For the dioxins which are composed of PCDDs, PCDFs and the PCBs dioxin-like, several organisations propose a Reference Dose for oral intake, (since oral intake is the main exposure to dioxins, no Reference Dose exists concerning breathing exposure). A Reference Dose is the maximum tolerable oral dose of a toxic substance. Under this dose, there is no observable sanitary effect. As for Reference Concentration, this is the maximum tolerable concentration of a toxic substance.

The World Health Organisation proposes a Reference Dose for an oral daily exposure to dioxins. It is called the Tolerable Daily Intake (TDI). This dose is from 1 to 4 pg/kg I-TEQ_{OMS}/day. Concerning human blood, the W.H.O. proposes a Reference Concentration in serum; its value has evolved along time, according to the knowledge on dioxins toxicity. In 2005, the value is 18.5 pg TEQ_{2005}/g of fat material.

Measuring Of Dioxins in the Environment and In Foodstuffs

Techniques of identification and of measuring out of dioxins are complex and depend on the nature of the sample to analyse. Dioxins must be extracted with appropriate solvents, purified, the diverse families of dioxins must be separated, each type of dioxins identified and finally measured out. Furthermore, the quantities to be measured are in the order of the pictogram (pg).[131] These analyses require costly and quite rare materials; only a few laboratories can afford the required materials. The cost of identification and measuring out is thus very expensive: from 750€ up to 1500€ according to the medium.

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[130] Different dioxin compounds have different toxicities and dioxins are most often found in mixtures rather than as single compounds in the environment. The most toxic forms of dioxin are 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD. Scientists use a shorthand method for comparing the toxicity of different types or mixtures of dioxins to the toxicity of 2,3,7,8- TCDD and 1,2,3,7,8-PeCDD. This method is called the "Toxicity Equivalence" or TEQ.
[131] 1 pg=10^{-12}g=0,000000000001g

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In the framework of the 10 decision-making processes, it is possible for the public authorities and for the local NGOs to order to specialized laboratories the measuring of dioxins in samples which can contain dioxins: air, soils, vegetation, animal fat, cow's milk, and eggs. To assess the contamination of humans, it is possible to measure dioxins in samples of blood or maternal milk.

Studies to Measure the Sanitary Impact of Incineration Plants

Five types of studies can be envisaged to measure the sanitary impact of a household waste incinerator. The choice of the study depends on the question to which one wants to answer, but above all, it is limited by the data actually available. The studies likely to be set up to measure the sanitary impact of an incineration plant are:

- 'Literature studies', which enable the grasping of the situation, to formulate a question concerning the incurred risks and their nature, and to find some elements of the answer.
- 'Environmental studies', which enable the evaluation of the contamination of the environment detecting and quantifying the presence of determined molecules.
- 'Exposure studies', which describe the exposure of individuals to a determined substance. The exposure is evaluated through environmental studies and/or the measurement of biological markers in organisms (for example, the measuring out of dioxins in blood).
- 'Sanitary risk evaluation studies', which enable the definition of the effects on health of substances or dangerous situations. These studies notably combine environmental studies, exposure studies and the Reference Doses and/or Reference Concentrations.
- 'Epidemiological studies', which compare diverse populations of individuals and make possible the description and explanation of the sanitary situation of the studied population. Descriptive and comparative epidemiological studies (unique or repeated through times) are the most adapted to study the sanitary impact around an incineration plant at the local level. These epidemiological studies consist of the research of correlation between the exposure to dioxins released by an incineration plant (for the residents living under the plum), and the development of determined diseases. If registers with sanitary data, such as the number and types of cancers, are not available, such epidemiological studies are impossible to conduct.

In principle, during the decision-making processes, the local NGOs have the possibility to mobilise the five types of studies listed above, when available. They may simply seek existing studies, or they may order local studies concerning their incineration plant by third parties

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such as private or public laboratories. The local NGOs might themselves carry out some studies, but it is unlikely that they have the internal human and technical resources to realise such studies.

In the case of the pollution by the dioxins emitted by incineration plants, some types of study are easier to carry out than others. To begin with, 'environmental' and 'exposure' studies are the most simple to carry out since they consist of the measuring of dioxins in samples taken from the environment (for example in the soil, animal fat, eggs) or from humans (blood or maternal milk). As I have stated above, however, these studies are rather expensive for the budget of the local NGOs. Furthermore, in France only a few laboratories are able to make these measurements; it may be thus not easy to find them out. 'Sanitary risk evaluation studies' are more complicated to carry out because they are a combination of, among others, 'environmental' and 'exposure' studies, and the interpretation of the results require highly skilled scientists. Only research institutions or State agencies are able carry out such studies. 'Epidemiological studies' are the most complicated studies to carry out because a large number of conditions must be met, among others: some registers of cancer must be available (not in all hospital are such registers kept), no other sources of dioxins than incineration plants (such as a chemical industry) must be next to the studied population, the diet of the studied population must be monitored (since the main exposure is due to foodstuffs), numerous individuals must accept to participate to a research which is constraining and time consuming for them. Such studies are likely to be carried out only by teams of researchers or state agencies because they require a lot of human, technical and economical resources. 'Bibliographical studies' are probably the easiest source of information for the local NGOs, but they are often rather general and they do not provide precise answers.

Measurement of the Emissions of Pollutants

The directive 2000/76/ec of the European Parliament and of the Council on the incineration of waste imposes the carrying out of the following measurements of air pollutants at the incineration and co-incineration plant:

- continuous measurements of the following substances: NOx, provided that emission limit values are set, CO, total dust, TOC, HCl, HF, SO2; (compulsory for all the facilities only from 2005)
- at least two measurements per year of heavy metals, dioxins and furans; one measurement at least every three months shall however be carried out for the first 12 months of operation.

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A (not legally imposed) system of semi-continuously measurement of the emissions of dioxins also exists. This system (COPER-DIOX® type) consists of cartridges of resin which collect dioxins at the mouth of the chimney. Every three/four weeks, the cartridge is taken out and the dioxins are identified and measured in a laboratory. Furthermore, collectors in form of cones opened towards the sky, gather the fall out. They are disseminated in a range of a few kilometres around the incineration plant. Regularly, the content of these cones is collected and analysed in a laboratory.

Obviously, these measurements concern incineration plants which are running. Consequently, these measurements play a role mainly in the decision-making processes for the setting up of new incineration plants in which an old generation incineration plant used to run. For example, the local NGOs may put forward the argument that the old incineration plant did not respect the norms of emission of pollutants in order to undermine the position of the public authority. However, the measurement of the emission of pollutant can be an issue also for the new incineration plant projects: during the third stage of the decision-making processes, once the incineration plant is under construction and will open without any doubt, the local NGOs may ask for the setting up of more constraining monitoring systems, such as the COPER-DIOX® type system.

Dioxins, Incineration Plants, and Scientific Expertises: The Big Uncertainty

Controversies around incineration plant projects stem from the scientific uncertainties about the effects on health of dioxins emitted by the incineration of wastes. On one hand, the adverse effects of dioxins on health are acknowledged by the scientific community. The most known effects are about the development of cancers.[132] The most informative epidemiological studies concern the workers of pesticide facilities, and the residents of Seveso2 who were accidentally exposed to a specific dioxin (the 2,3,7,8 TCDD). Following the results of these studies, in 1997, the International Agency of Research on Cancer (IARC) of the World Health Organisation classified this molecule as carcinogenic substance for man.[133] Concerning the population of Seveso, a recent study has shown that the risk of developing a non-Hodgkin's

[132] Effects on the reproduction and development are the object of conflicting results. No clear evidence exists today. Spontaneous abortions, congenital malformations, changing of the ratio of sex at birth, diminution of fertility, diminution of the weight at birth, lateness of sexual maturation and of the neurobehavioural development, have been evoked (see Institut National de la Santé Et de la Recherche Médicale, 2002)
[133] International Agency for Research on Cancer, 1997

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lymphoma has been multiplied by 2.8 for the residents of the most exposed area.[134] However, the rate of exposure for this population was from 100 to 1000 times higher than for the general population.

On the other hand, there are still uncertainties as to the health effects of incineration plants. As a matter of fact, there are few studies, and they have been realised recently, after 2001. I note that the decision-making processes studied in this research started at the beginning of the 90's and finished between 2003 and 2005. Thus, no study was available during the greatest part of the decision-making processes. The only available epidemiological studies were published in 2000 and 2003.[135] These studies confirm a correlation between the fact of living next to an incineration plant with high dioxin emission levels and the risk to develop non-Hodgkin lymphoma. But these studies concern an old generation of incineration plant, and the supporters of incineration argue that modern incinerator released much less dioxins, and thus that there is no longer any risk.

It was clearly the public concerns which incited the national state agencies to lead some epidemiological and exposure studies about dioxins emitted by incineration plants. Indeed, it was only in 2003, because *"waste incineration [was] still a cause for concern for the general public in light of the significant emission of pollutants, specifically dioxins, emitted by certain waste incinerators that were recently shut down or brought up to standards"* (Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2003, p. 199), that two state organisations, the *Institut de Veille Sanitaire* (National Institute of Public Health Surveillance) and the Agence Française de Sécurité Sanitaire des Aliments (French Food Safety Agency) started a study on the dioxin exposure of people residing in close proximity to municipal solid waste incinerators (MSWIs). They studied as well the determinants of this exposure, specifically the consumption of local products. That study, the first one to use French data on serum concentrations of dioxins and PCBs, has been published at the end of 2006.[136] It concluded that *"on the whole, there is no difference of the levels of dioxins and PCBs between the residents living next to incineration plants and the residents*

[134] Bertazzi PA, Consonni D Bachetti S et al., 2001
[135] Viel JF, Arveux P Baverel J Cahn JY, "Soft–tissue sarcoma and non-Hodgkin's lymphoma clusters around a municipal solid waste incinerator with high dioxin emission levels", *American Journal of Epidemiology*, 2000, p. 13-19.
Floret N, Mauny F Challier B Arveux P Cahn JY Viel JF, "Dioxin emissions from a solid waste incinerator and risk of non-Hodgkin lymphoma", *Epidemiology*, Vol. 14, 2003, p. 392-398.
[136] Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, Étude d'imprégnation par les dioxines des populations vivant a proximité d'usines d'incinération d'ordures ménagčres. Synthčse des résultats, France, 2006.

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not exposed to known sources of dioxins. On the contrary, the study concerning the 'autoconsumers'[137] *shows the influence of the consumption of local product such as milk products, eggs, and animal lipids on the development of cancers. However, this study underlines that for the recent MSWIs, there is no real difference among the autoconsumers residing next to the MSWI and the control population non exposed"* (Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2006b, p. 16, translated by the author).

Further, there is also an epidemiological study that was published by the Institut de veille sanitaire in 2006. This study shows a correlation between the fact of residing under the plume of an incineration plant and the increasing of the risk of certain cancers. However, it is specified that *"since the study concerns a situation [old generation incinerators which ran between 1972 and 1985], the results can not be transposed to the situation currently generated by incineration plants, which are less pollutant and better controlled than before."* (Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2006b, p.9, translated by the author). However, it is also stated that a link has been established between the development of cancer and the exposition to the incineration plants' discharge, but that the pollutants responsible have not been identified. In any case the two studies exposed above were not realised yet during the decision-making processes studied in this research.

To conclude, at the time of the ten decision-making processes (1992-2005), few bibliographical and or epidemiological studies concerning dioxins emitted by incineration plants were available, and uncertainties were very high at the time of the ten decision-making processes. The local NGOs may order environmental or exposure studies by private or public laboratories. Within bibliographical studies about dioxins and waste incineration, there is no scientific controversy, only scientific uncertainty. The scientific community already asserted that dioxins present a sanitary risk: high exposure to these molecules can provoke the development of cancer. Adverse health effects of dioxins depend on the quantity of dioxins ingested through feeding. But there was no evidence that an incineration plants which runs according to the norms actually provoke cancers. The debate concerns the quantity of dioxins

[137] "Autoconsomateurs" in the original text, which means: individuals who consume foodstuffs of their own production.

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actually released by the incinerator on one hand, and the quantity actually ingested by the residents on the other hand.

Scientific uncertainty becomes manifest in the controversy between two academics, Prof. Belpomme on one hand, and Prof. Narbonne on the other hand.[138] Mr. Narbonne is Professor of Toxicology at the University of Bordeaux I. He argues that no sanitary risks are entailed by new generation incinerator, and consequently, he is against a moratorium on incineration.[139] On the contrary, Mister Belpomme, Professor of Oncology at the European Hospital Georges Pompidou (Paris), is opposed to waste incineration, and in the framework of a more general argumentation about the environmental causes of cancer, he claims that there are some cancers linked to incineration.[140] In this context of scientific uncertainties, I look at the importance of scientific knowledge for the engaged NGOs.

[138] According to the theoretical framework developed by Funtowicz and Ravets, the dioxin/incinerator case can be qualified as a 'post-normal science' situation (see Funtowicz S. and Ravetz J., 1992 for further details about this theoretical framework). Indeed, the level of uncertainty can be considered as high – dioxins pose a hazard to health, but the actual impact on health of incineration plants is uncertain-; and the stakes as high too – the resident's life is at stake.
Bryan Wynne developed a theoretical framework which distinghuishes different types of uncertainty situation Among the four types defined by Bryan Wynne (uncertainty, risk, indeterminacy, and ignorance), the dioxin-incinerator case can be label as an 'uncertainty' type since the main parameters – heath effects of dioxins, modes of exposure – are known, but the odds – the actual exposure of the residents, and the pathologies developed by the residents – are very partially known. The "uncertainty" can be reduced by further researches, which does not, in principle, pose problems (see Wynne B., 1992 for further details about this theoretical framework).
[139] See the web-site www.lanutrition.fr: http://www.lanutrition.fr/Jean-Fran%C3%A7ois-Narbonne-Moratoire-sur-l-incin%C3%A9ration-la-grosse-arnaque-a-1948.html, last access date: March 2009.
[140] See the web site of the NGO ARTAC founded by Prof. Belpomme:
http://www.artac.info/static.php?op=ReponsesDioxines.txt&npds=1, last access date: March 2009

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Chapter 7
Public Mobilisation of Scientific Expertise: Theoretical Framework

This chapter sets up the theoretical framework concerning the mobilisation of scientific expertise by the NGOs. It is divided into three sections. The first section details the theoretical perspective adopted in this part of the research. The second section proposes a property space which enables a classification of the sources of scientific expertise sought by the NGOs. Section three introduces the property space of the reasons why the NGOs may not mobilise scientific expertise. Finally, section IV deals with the discourses hold by the engaged NGOs in order to bring the wider public and the public authority around to their view.

I. Theoretical Perspective: A variant of the 'Critical' Approach of Public Understanding of Science

The aim of this section is to introduce the theoretical background which underpins the theoretical frameworks I use in this research. The Public Understanding of Science (P.U.S.) is the common labelling of the discipline which studies the way 'lay people' manage scientific knowledge. The PUS field can be divided into two approaches: the traditional and the critical. One way of interpreting these two approaches is to see them as yet another instance of the opposition between quantitative and qualitative methodologies (the traditional approach being

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quantitative and the critical approach qualitative).[141] The principal terms of that debate are whether the traditional approach, which has been relying on questionnaires, really grasps public understanding, and whether the critical approach, which has been studying local communities, can really lead to viable generalization. The critical PUS literature suggests that the difference between both approaches is not merely technical but also epistemological: each approach would entail different tacit representations of what is 'public' and of what 'understanding' is. As a consequence, their points of view about the role that the public must or can play in the production of scientific expertise and in public decision-making are divergent.[142] In the first following subsection, I introduce the two approaches of PUS, and then I make a criticism of them. In a second sub-section, I specify the theoretical perspective I have adopted in this research.

I.1. Traditional Versus Critical Approach of Public Understanding of Science

The 'Traditional' Approach

To date, in the Public Understanding of Science (PUS) field, the traditional approach means 'questionnaire surveys'. These questionnaires mainly aim to measure the scientific literacy of the population in term of method and knowledge or the attitude of the public toward science; a lot of publications have been made:[143] In the scientific literacy questionnaires, after the interviewee has answered some demographical and sociological questions about himself (age, sex, profession, etc.), he is mostly asked to answer 'Yes, No, Don't Know' to propositions such as:

- *"There are bacteria which live in waste water;"* or

[141] As I have stated in chapter 1, the terms 'traditional' and 'critical approaches were first coined by Mike Michael (Michael M., 2002b). 'Qualitative PUS scholars' have respectively labelled these two approaches with different terms: Survey research/Constructivist social and anthropological research (Wynne B., 1995); Questionnaire method/Ethnographic perspective (Irwin A. and Michael M., 2003, p. 58). The term 'ethnographic' mainly refer to the use of a given methods, and is thus too restrictive; 'Constructivist social and anthropological research' is more complete, but it makes the label too long. Thus, I prefer to use the labels 'traditional' and 'critical' since they symbolise the two steps evolution of the PUS field.

[142] For a thorough presentation of the Public Understanding of Science field, see: Wynne B., 1995; Bucchi M., 2003; and also Michael M., 2002; Bucchi M. and Neresini F., 2008.

[143] Concerning the scientific literacy see for example the following publications: Miller, J. D., 1983; Durant J., G. Evans and P. Thomas, 1989; Evans G. and Durant J., 1995; Miller, J. D., 1998; Allum N. C., D. Boy M. W. Bauer, 2002; Edmond, Gary and Mercer, David, 1997Caillot, Michel and Nguyen-Xuan, Anh, 1995Millar, Robin, 1994Zhang, Zhongliang and Zhang, Jiansheng, 1993Durant, J, Evans, G, and Thomas, G, 1992.
Concerning the attitude of the public toward science, see for example the following publications: Gutteling, Jan M., 2002.Evans, Geoffrey and Durant, John, 1995Filacek, Adolf and Krizova-Fr²dova, Eva, 1994Gaskell, George, Wright, Daniel, and O'Muircheartaigh, Colm, 1993Peters, H P, 1992

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- *"More than half of human genes are identical to those of a chimpanzee."*

(Gaskell, 2002)

In the conclusions to these pieces of research, the lack of scientific literacy has been considered rather worrying in an era where 'scientific literacy' is viewed as a positive and important property, ensuring greater practical competence in everyday life, enhancing employability, and ability to become involved in democratic life. This last point is considered to be the most important at a time when governments are increasingly taking up the idea of public participation and consultation about the direction of new technological developments, and many scientists defend the idea that a scientifically literate public is a prerequisite to an effective public participation in democratic life concerning technoscientific issues. Furthermore, scientists argue that a scientifically educated public will tend to be more supportive of science and technology. In other words, it is argued that some opposition to new technologies is grounded in ignorance or mis-information, sometimes presumed to be the result of biased media reporting. Thus, it is argued that information campaigns to inform the public about the 'facts' and methods of science will be effective in cultivating greater public confidence in science and technology. This view of the public has been labelled *'deficit model'* (Wynne B., 1991), and has been supported by studies showing a correlation between support for science and the level of scientific literacy (see for ex. Evans G. and Durant J., 1995, and Allum N. C., D. Boy M. W. Bauer, 2002Allum N. C., D. Boy M. W. Bauer, 2002).

The 'Critical' Approach

As its label indicates, the critical approach has been built in opposition to the traditional approach. The traditional approach with its questionnaires and its conclusions about the *'deficit model'* have been criticised by critical PUS scholars such as Alan Irwin and Brian Wynne (see Wynne B., 1991; Irwin A. and Wynne B., 1996). Brian Wynne argues that the results of the questionnaires do not mean that scientific knowledge causes support for science; the causal relation might just be the reverse. Supporting science – for example in the belief that it will bring progress – may make people more interested in matters of science, and encourage them to seek more information about it. Yet active opponents of science could have the same attitude. These scholars developed their criticism upon what they consider as three normative assumptions entailed by the traditional approach (see Irwin A. and Michael M., 2003 and also Wynne B., 1995).

Firstly, they argue that only scientific knowledge has been considered and that the aim is to confront lay person's incorrect knowledge with scientifically-certified knowledge. According

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to them, the questionnaires made by the traditional approach scholars only measure whether persons are right wrong or ignorant according to standard scientific knowledge. The critical approach scholars criticises this reduction and argue that people may possess highly relevant and useful knowledge, even if they do not meet scientific standards.

Their second point is that in the traditional approach people are considered only as a repository of knowledge; and that the manner in which questionnaires are constructed removes the interviewee from his social and cultural context. According to the critical scholars, in the traditional approach questionnaires, questions related to health or environmental risks, ethics and consumer choice are not addressed in the manner they are usually presented in the everyday life, but in an abstract and de-contextualised fashion. Finally, they argue that the reasons for the rejection of certain scientific knowledge are not explored.[144]

Thirdly, the critical scholars argue that questionnaires do not take into account the moral and reflexive dimension of people. They claim that the traditional approach fails to envisage that people are able to construct their responses considering a variety of political, moral, ethical, religious concerns, and that people are aware of the extent of their knowledge, of what they know and what they do not.

In order to overcome the limits of the traditional approach they have identified, the critical approach scholars search to examine the influence of social-cultural contexts and social relations upon people's '*renegotiation*' of the standard scientific knowledge delivered by institutions:

> *"Once we move outside a simple "cognitive deficit" model of the public understanding of science, we become increasingly aware of the range and variety of possible interactions between people's existing understandings of particular situations and those that emanate from science. In order to pursue this, our research has attempted to locate issues of the public understanding of science within specific practical social contexts."*
>
> (Wynne B., 1991, p.113)

[144] The authors suggest that the reasons of the rejection can be linked to the values or identities of the interviewee. For example, a fundamentlist Christian could have no knowledge about the theory of evolution simply because he is a creationist, and so he does not want to here anything about evolution. Obviously, the exploration of the reasons of such rejections does not, and does not intend to, invalidate the evolutionary model.

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The '*critical*' approach assumes that people are able to '*renegotiate*' scientific knowledge delivered by institutions. While according to the lexical definition '*renegotiate*' means 'try to reach an agreement or compromise by discussion', for the critical PUS approach '*renegotiation of scientific knowledge*' means that the public is able to reflect on the source of their knowledge (media or others): they are able to assess the credibility of the source and to evaluate the quality of the knowledge they have acquired. In other words, this approach seeks to take into account trustworthiness, credibility, and usefulness in the Public Understanding of Science, considering aspects such as social identity, practical circumstance or personal responsibility, in the framework of detailed, context-specific and local analysis. As Alan Irwin and Mike Michael as put it about 'lay epistemology':

> *"Lay people may not possess knowledge, but have knowledge of how they know: they are able to reflect upon why take on board some 'scientific facts' but not others; they are competent in accounting for why they prefer some sources of knowledge (e.g. personal experience) over others; and they can justify why they trust some expert authorities and are suspicious of others."*
>
> (Irwin A. and Michael M., 2003, p. 28)

As for the methodology, the critical PUS scholars use qualitative methods to investigate in depth the motivations, feelings, and reactions of selected social groups towards a given subject or concept: they listen and analyse the way people express themselves through discussion groups, (open or semi-structured) interviews, participant observations, or document analysis.

To conclude, the critical approach of PUS suggests a series of important assumptions for technical-scientific public decision-making which are in opposition with the traditional 'top-down' (or expert driven) approach:

- *"The multiplicity and diversity of the publics;*
- *The knowledgeability and 'local expertise' of lay groups;*
- *the limitation of scientific-technical knowledge when applied to new settings;*
- *the legitimacy of public concerns and questions;*
- *the importance of values, ethics and prior experience;*
- *the requirement for more open and two-way communication, including the communication of scientific uncertainty;*
- *the fundamental importance of self-critical and reflexive top-down processes."*

(Irwin A. and Michael M., 2003Irwin A. and Michael M., 2003, p. 42)

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Confusion between Methodology and Epistemological Assumptions

From the PUS literature analyzed above, it seems that there has been confusion between methodologies and epistemological assumptions. As we have seen above, the critical approach resorts to qualitative methodology while the traditional approach employs quantitative methodology. Now let's analyse the two main intertwined normative assumptions entailed by both approaches. These are the '*focus*' and the '*consideration of knowledge*' (they are summarised in table 8 below). To start with, the '***focus***' of the traditional approach is the scientific literacy of the public and the public's attitude toward science; moreover the questions are not addressed in the manner they are usually presented in the everyday life, that is not in '*context*', but in an abstract and de-contextualised fashion. In opposition to this view, the critical approach focuses on the '***renegotiation***' of certified scientific knowledge by the public. As I have stated above, in the critical approach perspective, '*renegotiation*' means that the public can have an active attitude toward scientific knowledge, that is, that the public can select some sources of scientific knowledge and not others, that it has its reasons for trusting more certain sources than others, that ignorance can be a self-conscious choice, and that it can mobilise other kinds of knowledge. In other words, the critical approach does not consider 'not knowing' only as a lack of scientific literacy; the 'not knowing' may be a self-conscious choice. Furthermore the critical approach carries out its empirical research in the '*context*' in which the public may face scientific knowledge. Contexts are, for example: volunteers who have kept a small plastic Radon detector in their home in the frame of a Radon survey (Michael M., 1996a), or sheep farmers facing pollution by radioactive elements (Wynne, B, 1992c). Concerning the '***consideration of knowledge***', the critical PUS scholars have criticised the 'positivist' view of scientific knowledge embedded in the questionnaires and then they have taken an opposite position which can be qualified 'relativist' with regard to scientific knowledge. Firstly, they consider as equal scientific knowledge and *"all sorts of highly relevant and useful knowledge, even if such knowledge doesn't meet the exacting standards of scientific inquiry"* (Irwin A. and Michael M., 2003) that people possess. Secondly, they assume that all people have the ability to be reflexive regarding the acquisition of their scientific knowledge. In this sense, the critical approach can be said to have a 'positivist view of lay people'.

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Table 8. Epistemological assumptions of the critical and traditional P.U.S. approaches

	Critical P.U.S. (qualitative, interpretative)	**Traditional P.U.S. (quantitative, questionnaires)**
Focus	Scientific knowledge in its social every-day '*context*' / '*renegotiation*' of scientific knowledge	Knowledge of certified science
Consideration of knowledge	All types of knowledge (scientific and lay) are considered as useful	Scientific knowledge is superior. Other kinds of knowledge are left out of consideration.

I share the position of the few scholars who claim that that confusion has been made between methodological and normative assumption (Nisbet, Matthew C. and Goidel, Robert K., 2007/10/1Bauer, Martin W., Allum, Nick, and Miller, Steve, 2007/1/1; Sturgis, Patrick and Allum, Nick, 2004/1/1; Kallerud, Egil and Ramberg, Inge, 2002/7/1). As the above table shows, the 'critical' and 'traditional' approaches have been respectively linked to a series of epistemological assumptions about the focus and consideration of knowledge. There has been a fallacious essentialist divide between the two approaches. As Sturgis and Allum put it *"de facto orthodoxy [...] has connected the deficit model and contextualist perspectives with quantitative and qualitative research methods respectively"* (Sturgis P. and Allum N., 2004, p. 55). The scholars quoted at the beginning of this paragraph have attempted to address this fallacious essentialist divide: they resorted to the traditional approach methodologies (*i.e.* questionnaires) but with a critical approach concerning their focus (study of the public in local contexts).

I.2. A Variant of the Critical Approach

In this research, I do not attempt to address the critical-traditional divide. However the approach I use in this research can be considered as a variant of the critical approach. Indeed, I adopt the '*consideration of knowledge*', and '*focus*' of the critical approach, but with some differences. To start with, concerning the '*consideration of knowledge*', my position is less "relativist" than the one of the critical approach. I recognise the validity of other kind of knowledge, such as social or local knowledge, and I share the point of view of Alan Irwin about public groups:

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> *"Public groups can be expected to bring more than a blank sheet of paper to environmental debate: memories of previous incidents, moral judgments and forms of local knowledge can all play a part in local understanding of environmental issues and in the very constitution of these 'issues'."*
>
> (Irwin A., 2001)

But I consider scientific knowledge and scientific experimental methods as superior to the other kinds of knowledge in order to understand the natural world. Whenever relevant comparisons are made, science tends to be more reliable than other kinds of knowledge. I do not claim at all that the scientific knowledge can alone manage the technical-scientific problems linked to society, but I claim that scientific expertise should remain a foundation stone of technical-scientific public decision-makings. In fact, in this research, I concentrate on scientific expertise; this is only for the last research question that I analyse other kinds of arguments than 'scientific expertise'.

This research rather falls in the critical PUS approach. The '*focus*' of this research is similat to the one of the critical approach, that is, the '*renegotiation*' of scientific knowledge in '*context*'. For the three research questions, the '*context*' is the decision-making processes for the setting up of incineration plant facilities, and the public in this context is the NGOs; I have not selected the public in a random way as usually done in the traditional approach. It is now important to state what '*renegotiation*' consists of for the three research questions. In fact, my approach is a variant of the critical approach because it has a more dynamic view of the attitude of the public (here the NGOs) toward scientific knowledge: the critical approach still deals with the 'understanding' of science by the public, which implies still a passive view of the public; while I think that it is interesting to study the way the public seek scientific expertise. Concerning the research question number 4, I set up a typology of the sources of scientific expertise that the NGOs selected. I look at the '*renegotiation*' of scientific expertise in the sense that I analyse the active behaviour local NGOs may have toward scientific expertise: the research of scientific expertise is at the core of this question. For research question number 5, I study the '*renegotiation*' of scientific knowledge in the sense that I explore the reasons that the NGOs invoke to explain the fact that they did not seek for scientific expertise. In the 10 decision-making processes, some local NGOs probably sought scientific expertise; when they did, they selected certain sources and did not consider some others, moreover some NGOs might themselves carry out some scientific investigation, or more probably some NGOs ordered a third party such as private or public laboratories to carry out some scientific study. Finally, in the last research question about the importance of

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scientific expertise in the discourses of the NGOs, the '*focus*' is clearly the renegotiation of scientific knowledge since I analyse the way the NGOs use scientific knowledge in the discourses they address to the wider public and the public authorities.

Finally, the methodology I use is the one of the critical approach, that is, qualitative: semi-structured interviews with the engaged NGOs, and analysis of the documents published by the NGOs. However, as I have stated above, one could have resorted to questionnaires (the methodology of the traditional approach) to answer the same research questions. The reason why I resort to qualitative methodologies is that I had little clue about the answers of the NGOs before the beginning of the research. So I could not set up a structured questionnaire. In further researches concerning the mobilisation of scientific expertise by NGOs in similar contexts, knowing the possible answers of the interviewees, I would certainly resort to questionnaires. As I have stated above, I believe that the essential divide traditional approach-quantitative methodologies *versus* critical approach-qualitative methodologies is fallacious.

In the approach I held in this research, I make eight assumptions which mostly, but not entirely, overlap with the critical approach assumptions:

- the necessity to base technical-scientific decision-making on scientific knowledge, since it has a special access to the truth to the natural world;[145]
- the importance of values, ethics and prior experience in technical-scientific expertise;[146]
- the limitations of scientific-technical knowledge when applied to new settings;[147]
- the multiplicity and diversity of publics; public as a general entity is a useless concept:
- the legitimacy of public concerns and questions;
- the relevance of social and local knowledge to complete scientific-technical expertise;
- the scientific and technical knowledgeability of lay groups.

As a conclusion, my approach is a variant of the critical approach. Here there are many commonalties with the critical approach. However, there are two main differences. First, I concentrate on scientific expertise (I deal little with some other types of knowledge). But

[145] By 'truth', I mean that natural sciences have a special ability to understand and predict the 'behaviour' of material.
[146] See chapter 1, for further details on this issue
[147] See chapter 1, for further details on this issue

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above all I consider that the public (here the local NGOs) can have a more active attitude toward scientific knowledge than the mere 'understanding': they may seek determined scientific expertise, and they may even order to a third party or realise themselves some scientific expertises.

The label 'Public Understanding of Science' has been coined by the traditional approach, and reflects a series of choices made by this approach concerning the non-contextualisation of the research (the terms 'public' and 'science'), and the passive view of the public ('understanding'). This research is a Public Understanding of Science study in a determined context: the **mobilisation** of **scientific expertise** about dioxins by the local **NGOs** engaged in ten decision-making processes for the setting-up of incineration plants. So this research can be label as a 'NGOs Mobilisation of Scientific Expertise' study, which is more specific than 'Public Understanding of Science' study.

II. Sources of Scientific Expertise: a Property Space

It is useful to begin this sub-section with the definition of two key terms: *'scientific expertise'* and *'expert'*. A piece of expertise is produced by an expert. I adopt the definition of ***'expert'*** given by the Collins English dictionary: *"An expert is a person who is very knowledgeable about or skilful in a particular area."* (Oxford English Dictionary). In this research, the term ***'scientific'*** refers to the natural science disciplines, such as physics, chemistry, or biology. In this research I do not deal with other kinds of expertise such as social scientific or economic scientific expertise. The term ***'scientific expertise'*** means the analysis of a specific natural phenomenon or technological object using physical, chemical or biological knowledge. ***'Scientific expertise'*** is different from fundamental research: it does not aim at determining general laws about the way the 'natural world' works. ***'Scientific expertise'*** employs scientific concepts, which are recognized as true and certified by the scientific academic society, in order to solve problems concerning real, determinate and concrete cases. In other words, *'scientific expertise'* is an application of scientific fundamental knowledge in a particular context. Consequently, a ***'scientific expert'*** is a person who has special skills in natural sciences (biology, physics or chemistry) and/or in engineering.

I have hesitated between using the terms *'scientific knowledge'* and *'scientific expertise'*. The matter is that *'scientific knowledge'* may appear very broad, covering all the knowledge produced by science, while the term *'scientific expertise'* may appear too specific. Since the point of departure of this research is the Science Study literature concerning the use of scientific expertise in the public decision-making processes, I have finally opted for *'scientific*

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expertise'. To conclude the definitional issue, in this research, *'scientific expertise'* refers to the scientific knowledge which deals with the impact of the pollutants released by incineration plants on the environment and on health.

As we have seen in chapter 1, many Science Studies have analysed the problems entailed in the use of scientific expertise by public decision-makers. And the conclusion of these analyses has been the need to extend the domain of technical decision-making beyond the technically qualified 'elite', so as to enhance the quality of expertise. While the traditional PUS has studied the attitude toward science and the scientific literacy of the public, the critical PUS studies have dealt with the relationship between the public and the experts, such as sheep breeders and radioactivity experts (See Wynne B., 1989, Wynne B., 1995, Irwin A. and Wynne B., 1996), or have entered the black box of scientific ignorance (See Michael M., 1996). Critical PUS scholars have attempted to shed new lights on lay knowledge, illustrating the relevance of this kind of knowledge. But I have found no Science Study about the sources of scientific expertise of the public (i.e. the NGOs in this research), and I have found no typology of these sources of scientific expertise.

To make the link with part II, I remind the reader that the point of departure of this research is that public involvement is envisaged as a solution to the problems of traditional expertise.[148] It should also be borne in mind that according to the model based on the concept of flow of information used in Part II, public involvement aims at maximising the quantity of relevant information between the public authority and the maximum quantity of relevant public, and that the aim is not to give the public the final decision. The contribution of the public in the decision-making processes is therefore intended as the bringing in of extra knowledge to solve the problems of traditional scientific expertise.

I distinguish two types of knowledge that may be brought by the public: local-social knowledge, and technical-scientific knowledge. By ***'local knowledge'*** I mean the knowledge held by local inhabitants about specificities (economical, social, geographical, and so forth) concerning the area where the incinerator has been planned. For example, the local knowledge may be about a specific local economic activity, such as a renowned wine culture, which may commercially suffer from the incinerator's vicinity. By ***'technical-scientific knowledge'***, I

[148] As I have stated in chapter 1, section I, the problem of scientific expertise in public decision-making processes fall into three categories: suspicion of non-competency (unadapted knowledge-problem of framing, uncertainty, confusion between fact and value), suspicion of partiality (confusion between knowledge and personal interest), and consequently suspicion of excess of power (the experts have the power to define the very term of debates).

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mean scientific expertises the public may bring. Of course, this distinction is rough, and it would be interesting to make a refined classification of the types of knowledge the public may bring, and to analyse the way they answer to the problems posed by the traditional expertise, and under which circumstances. But this is not the focus of this research. The aim of this paragraph is to show that I am aware that the public may bring other kinds of knowledge than scientific expertise, but in this research, I focus on the scientific expertise mobilised by the NGOs. I aim at developing a typology of the sources of scientific expertise mobilised by the NGOs.

A recent article by Collins and Evans (Collins H.M. and Evans R., 2002) has been the first, and so far the only, attempt to establish a typology of scientific expertise. Concerning the sources of expertise, Collins and Evans distinguish two types of expertise based the training of the experts; these are the *'experienced-based'* and *'certified'* expertise. The term ***'experience-based'*** expert refers to *"[...] members of the public who have special technical [or scientific] expertise in virtue of experience that is not recognized by degrees or other certificates [...]"* (Collins H.M. and Evans R., 2002, p. 238). Individuals who have special technical expertise recognized by degrees or other certificates are ***'certified'*** experts.[149] We have two dimensions here: 1) the presence or absence of superior knowledge in some domain; that knowledge could be acquired through specialised training or through experience, and 2) certification. Certification is important as it allows the users of expertise to select experts without first checking in depth their credentials, which is often a difficult process. This distinction is useful, but not enough to build-up a pertinent property space of the sources of scientific expertise.

The main flaw is that this classification is based on the competences embodied in the members of the public; it does not take into account the faculty of the public to mobilise a third party to carry-out an expertise. It is thus necessary to make a distinction between the *'internal'* and the *'external'* expertise. ***'Internal expertise'*** consists of the competences embedded in the public (here the local NGOs); some members of the public have specific

[149] However, this dinstinction is not a key issue for these authors: as soon as they made this distinction they efface it arguing that experience-based experts are just plain experts, that the important point is that both types of experts have special skills not spread thought-out the population, but are found in small specialist groups. In fact, the reason why these authors define the term 'experience based expert' is that they do not want to use what they call the oxymoron notion of the 'lay expert' used in the literature of the Sociology of Scientific Knowledge. Indeed, they claim that "[…] 'layman' includes the sentiment 'someone who is not an expert', and this makes it all too easy to over-interpret the term 'lay expertise'. If those who are not experts can have expertise, that special reference does expertise have? It might seem that anyone can be an expert" (Collins H.M. and Evans R., 2002, p. 238).

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skills or competences, which can be *'experience-based'* or *'certified'*. Consequently *'internal experts'* are members of the concerned public. ***'External expertise'*** is the expertise mobilised by the public but produced by a private or a public laboratory, a state agency, a (certified) scientist, an experience-based expert, or by another NGO. Thus, *'external experts'* are not members of the concerned public. I therefore derive a property space of the sources of scientific expertise of the NGOs. The main dimension is the *'qualification'* of the expert (*'certified'* or *'experience based'*) while the second dimension is the group the expert belongs to (*'internal'* or *'external'* to the NGO). However, it is unlikely that an external experience-based expertise is a private or public laboratory or a state agency: such expertise is likely to be solely NGO affiliated. This means that *'experience-based'* and *'certified'* expertise are mutually exclusive. Experience and experience based are two distinct issues. Of course, a certified expert can have more or less experience in its domain of expertise. The main point is that he has competencies recognized by degrees or other certificates; whereas an *'experience-based'* expert has competencies which stem from his experiences, but without being recognized by degrees or other certificates.

The property space is summarised in table 9 below. In chapter 8, this property space will be refined in the light of the empirical study, and a typology will be developed (see chapter 8, section III). For this empirical study, the methodology employed is qualitative: the data are collected through three semi-open questions, and then the sources are listed and distributed in the property-space. The details about the methodology can be found in section III of chapter 8.

Table 9. Sources of scientific expertise: a property space

	Internal	**External**			
		Private Laboratory	**Public Laboratory (research institution/researcher)**	**State Agency**	**Other NGO**
Certified					
Experience Based					

III. Reasons for Not Mobilising Scientific Expertise

The NGOs that did not mobilise scientific expertise can be divided into two categories: those that did not seek expertise and those that failed to obtain the sought expertise.

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The reasons declared by the NGOs for failing to obtain the sought-after scientific expertise will be developed in the following chapter in an inductive way, while the analysis of the reasons for not seeking expertise is based on a typology developed by the critical PUS scholar Mike Michael (Michael M., 1996). As I have stated in the previous section, in the traditional Public Understanding of Science approach, ignorance is considered as a mere lack of certified scientific knowledge, a void, while the critical approach believes that the 'not-knowing' can be a self-conscious choice which should be explored; and in this research I have adopted a variant of the critical PUS approach in which I consider the public as potentially active toward scientific knowledge: not only can ignorance be self-conscious, but the public may seek scientific expertise. In other words, we should distinguish here between two situations: state and activity. Ignorance is a state of an actor who lacks knowledge (or holds false beliefs) about some matter. This should be distinguished from the activity of seeking or not seeking knowledge. As a state, ignorance is fully compatible with the activity of seeking knowledge. In fact it may be the very motive for seeking knowledge. In this research I focus on the activity of the local NGOs, and I envisage the not seeking of scientific expertise as potentially highly significant, and that the interviewees are allowed to elaborate the reasons of this non mobilisation. By the way, in this research I do not try to evaluate the actual scientific literacy of the NGOs concerning dioxins, I study the extent to which the NGOs turned toward scientific expertise. If they did not mobilise scientific expertise, I search for the reasons they invoke (If they did, I look at the sources of scientific expertise they selected; see section III of this chapter).

Mike Michael has studied the discourse about ignorance of techno-science and its risks, and he has built up a typology of the causes of (scientific) ignorance invoked by the laypersons (Michael M., 1996). He has analysed semi-structured interviews with volunteers who have kept a small plastic Radon detector in their home in the framework of a Radon survey carried out by a Local Council Environmental Health office, then he has built a typology of the discourses about ignorance. Mike Michael distinguishes three types of causes of scientific ignorance invoked in the discourses of the interviewees: *'mental constitution'*, *'division of labour'*, and *'deliberate choice'*. In ***'mental constitution'***, there is an acknowledgement of *'ignorance'* as *'not-knowing'*. But it is not considered as a lack of education but this is a constitutional incapacity which is invoked. These respondents declared that they have a *'non-scientific mind'*. The underpinning of such a discourse is a relation of subservience and dependence of lay persons toward science. The ***'division of labour'*** view consists of the reparation of competencies among members of the society: the lay person does

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his job and the scientists do another. In this view, the layperson is not dominated by science. Interviewees argued that *'it is not their job'*: ignorance is neither positive nor negative, lay person and science coexist and co-operate. In the ***'deliberate choice'*** discourse, respondents declared that they do not know and that they are not interested in knowing about radiation. Here scientific knowledge (about radiation) is considered as not essential to the primary issues at stake (the economic and political aspects of nuclear power).

In the Science Study literature, I have found no other research which deals with the causes of scientific ignorance declared by members of the public. This typology is at the basis of my empirical research, but in the light of the analysis of the empirical data I gather, I test its validity in a new context (the NGOs in the decision-making processes for the setting-up of incineration plants), then I refine it (see chapter 8, section II). Already, one can see that the most curious thing about Michael's typology is that it does not include ***'lack of training'*** or ***'education'***. Obviously, such a response was not made by the members of the *'public'* studied by Michael. Furthermore, there are of course other quite obvious reasons for ignorance the interviewees may invoke, such as the inability to access scientific information, or the costs of knowledge acquisition. We will see if these reasons are put forward by the NGOs in the ten decision-making processes for the setting up of incineration plants, or if they invoke other reasons.

From now onward, I will not employ the terminology used by Mike Michael (*'ignorance'*, *'discourses about ignorance'* and *'social construction of ignorance'*), which lack of precision, and which can lead to the misunderstanding of what I intend to do in this research. Instead of *'ignorance'*, I will talk about ***'no mobilisation of scientific expertise'***. And instead of *'discourses about ignorance'*, I will talk about the ***'reasons for not seeking scientific expertise'***.

To develop my typology, the methodology employed is qualitative: the data are collected through three semi-open questions; then the texts of the answers are analysed in order to identify whether the NGOs mobilised '*scientific expertise*' or not; at last, the reasons given by the NGOs for not mobilising '*scientific expertise*' are identified. The details about the methodology can be found in section II of chapter 8.

IV. Scientific Expertise in the Discourses of the NGOs

Once the NGOs have set up their position concerning dioxins and incineration plants, they try to bring the wider public (and the public authorities) round to their views. To reach such a

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goal, they are likely to try to build up their position through a series of selected arguments. This section provides a theoretical framework to answer the sixth research question: "Is scientific knowledge a key argument in the discourses of the public; what are the other types of arguments that the public employs to strengthen their position?" I have found no research about this aspect in the Public Understanding of Science literature. Consequently, the theoretical framework is novel, and consists of a series of different types of arguments the NGOs may use to gain '*credibility'* and consequently to strengthen their position. This section is made of three sub-sections: in the first one the concepts of '*credibility*' and *'strengthening of position'* are defined while the second explain the concept of *'cognitive credibility'* of science and sub-section IV.3 deals with the concept of *'moral credibility'*.

IV.1. Credibility and Strengthening of the NGO's Position

'Credibility' is the quality of being trusted or believed in. It can be defined as a form of intellectual capital that has to be built up, maintained and replenished. Expertise is a special case of credibility. It is based on domain-specific trust that is built over time and often institutionalised, *i.e.* subject to well defined quality controls. However, credibility is influenced by a broad range of informal (social, moral, political and cultural) factors. ***'Credibility'*** increases a social actor's effectiveness as it makes his/her specific claims acceptable without costly and uncertain *'verification'* procedures. Actors, here the local NGOs, therefore have a strategic interest in building up their *'credibility'* and, sometimes, in pointing the limitations of the *'credibility'* of their opponents. This is particularly important for 'new' agents entering a political-technical domain where expertise is highly institutionalized.

The local NGOs are in such a situation, they are little known by the public authority, and above all by the wider public, and thus, it is thus likely that local NGOs have little initial '*credibility*'. The initial '*credibility'* they may have is likely to rest on their socio-political position (for example, value congruence, local networks, engagement of well-trusted 'personalities', etc.) or/and on dramatic decrease in the credibility of the *'establishment'* due to some scandals or some other event like that. This form of initial '*credibility'* may, however, prove ephemeral, and has to be bolstered in other ways. Therefore, in order to bring the wider public and the public authority round to their view, (the abandonment of the local incineration plant project) the local NGOs have to build their '*credibility'* and to strengthen their position.

The '***strengthening of position***' refers to political effectiveness, while the ***'gain of***

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credibility' to the cognitive social capital. The latter contributes to the former: the local NGOs have to gain '*credibility'* in order to strengthen their position.

An important dimension of *'credibility'* is its social pervasiveness. In other words, the question is "credible for whom?": the general public, members of specific social movements/parties, professional experts, public authorities, etc. The credibility of some individuals or institutions can be very pervasive, *i.e.* accepted by virtually entire society. On the other extreme it may be limited to a handful of supporters. The strategies of building credibility among the general public may be different from those directed towards expert groups. In this research, I study the discourses of the NGOs, and these discourses are addresses to the public authorities, and to the wider public, that is to the electors of the public authority. In this process, the local NGOs do not try to gain *'credibility'* in the eyes of the certified experts.

IV.2. Cognitive Credibility

Credibility of Science

The concept of *'credibility'* has been inspired by the concept of '*boundary-work*' developed by Gieryn, or rather by the aim of boundary-work which is to maintain or increase the '*cognitive authority*' of science (see Gieryn T.F., 1995, p. 404-405; Gieryn T. F., 1983; Gieryn T.F., 1995; Gieryn T. F., 1999c), and first applied by Sheila Jasanoff (Jasanoff S., 1987; Jasanoff, S, 1990). According to Thomas Gieryn, boundary-work is used to demarcate science from non-science, and it is also employed within science for the ideological demarcations of disciplines, specialties, or theoretical orientations.[150]

[150] Gieryn has a constructivist view of 'the cognitive authority' of science. He contends that it derives not from universal or essential qualities of the scientific method, nor from the special insight these methods may provide. Rather, such authority derives significantly from the ways in which science is defined and represented, the people and institutions which are included in the boundary-setting process, and the various resources (financial, human, etc.) that these representations of science can mobilise. And, still following Gieryn, 'boundary-work' is a likely stylistic resource for ideologists of a profession or occupation, and he has distinguished three diverse boundary-work strategies that scientists use to demarcate science from non-science, and thus to maintain the 'cognitive authority' of science. These are 'expansion of authority', 'monopolization/expulsion', and 'protection of autonomy'' (Gieryn T. F., 1983, p. 791-792, Gieryn T.F., 1995, p. 424-439).

When the goal is expansion of authority or expertise into domains claimed by other professions or occupations, boundary-work heightens the contrasts between rivals in ways flattering to the ideologists' side.

When the goal is monopolization of professional authority and resources "each [contender] attaches authority and authenticity to claims and practices of the space in which they also locate themselves, while denying it to those placed outside." (Gieryn T.F., 1995, p. 424)

When the goal is protection of autonomy over professional activities, boundary-work exempts members from responsibility for consequences of their work by putting the blame on scapegoats from outside.

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In the present case, science represents institutionalized expertise enjoying arguably the highest ***'cognitive authority'***, at least in modern Western societies. In other words, science is considered to have privileged access to truth for the definition of the natural world. The *'cognitive credibility'* of science is broad (it includes a very wide range of specific areas), and socially pervasive (it is generally accepted throughout the society). For those reasons, there are likely to occur that this significant credibility 'spill-overs' into the areas outside the proper domain of scientific expertise. This is sometimes called a 'halo effect': people tend to be trusted beyond their actual area of expertise. This is one reason for the crisis of expertise I am talking about.

Actors seeking to influence decisions in the areas with a strong institutionalized expertise have to develop a strategy towards that expertise. The question is: "To what extent do these NGOs mobilise these certified scientific expertises in their discourses in order to gain '*credibility*' in the eyes of the wider public and of the public authority?" In other words, the local NGOs could try to benefit from the '*cognitive authority*' of scientific expertise in order to increase their '*credibility*'. I suggest that beyond the demonstration of credibility of the arguments they use, the NGOs have a medium term strategy of strengthening their position.

To confront the '*cognitive authority*' of science, actors such as the local NGOs could adopt four alternative strategies. The first one is ***'mobilisation'***: NGOs line up the support of science by identifying scientific consensus beliefs or initiating research by scientifically qualified institutions to provide certified data. The mobilisation is likely to be selective, NGOs likely mobilise only the scientific expertises which support their views. A second strategy could be the ***'challenge'***: NGOs question the authority of science and propose an alternative source of knowledge. NGO could adopt a ***'demarcation'*** strategy: they try to limit the authority of science by pointing to uncertainties in the state of knowledge and/or to conflicting theories/evidence. The containment is more likely to be used when scientific expertise may be unfavourable to the NGOs' position. At last, NGOs could resort to a ***'complementary'*** strategy: they identify complementary forms of expertise which are non-scientific, such as local knowledge, traditional beliefs, etc. These elements of strategy can be of course combined. *'Demarcation'* argument can be used to justify a selective *'mobilisation'* of scientific expertise in combination with advocacy of some forms of *'complementary'* expertise.

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Precautionary Principle

In case of scientific uncertainty, it may become difficult for the NGOs to rely on science to gain cognitive credibility. Indeed, the '*cognitive authority*' of given scientific expertises is likely to be undermined in the eyes of the wider public in case of absence of consensus within the scientific community. The local NGOs could adopt a *'complementary'* strategy resorting to the '*precautionary principle*'. As I have already stated in chapter 1, the precautionary principle can be briefly formulated as follows: in case of doubt over the potential serious or irreversible consequences of a *'technical-scientific object'* (for example the use of a new chemical, the introduction of a GMO in agriculture), protective measures must be taken (for example forbidding the use of the chemical, forbidding the use of the GMO open fields) and at the same time experts must be asked to search for conclusive scientific evidence of the innocuousness of this object.[151]

In this case, NGOs do not try to undermine the authority of science; on the contrary, they try to overcome the lack of cognitive credibility of scientific expertise because of uncertainties.

IV.3. Moral Credibility

'*Moral credibility*' means that actors are perceived as acting for the common good, and that they do not push for their personal interest as for example lobbies do. Local NGOs could resort to three types of arguments: '*overcoming the NIMBY label*', '*reference to national or international recognised NGOs*', and '*juridical arguments*'. This list is of course not exhaustive; these are the arguments which pop up in the light of the literature and of the study of the engagement of the NGOs in the 10 decision-making processes.

Overcoming the NIMBY label

From the literature, it seems likely that local NGOs have to defend themselves against the Not-In-My-Backyard (NIMBY) label. In the case of the setting up of incineration plants, the NGOs, because they are local, are likely to be suspected to oppose the incineration plant project because the selected site is next to their home. To gain '*moral credibility*' the local NGOs will probably have to overcome this pejorative label which highlights an egoistic attitude.

[151] See chapter 1 for further details about the precautionary principle.

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The general view of the NIMBY response of local populations refers to intense, local opposition to proposals for constructing facilities that residents believe will result in a negative impact. As C. Davis and J. Lester has analysed, the NIMBY reaction has become very common because of the distribution of costs and benefits (Davis C. and Lester J., 1988). Nuisances, such as effects on human health, environmental quality, or property values, are geographically concentrated while benefits concern a larger and more dispersed population. Location and perceived risk can be considered as the independent variables and the NIMBY response as the dependent variable. Typical NIMBY infrastructures are, for example, low-income housing projects, power plants, power lines, airports, prisons, halfway houses, sewage treatment plants, highways, dams, oil refineries, rail lines, military installations, junkyards, cemeteries, amusement parks, taverns, sex businesses, and, of course, household waste incineration plants. NIMBY has quickly become a major social issue, and has given rise to a blossoming of evocative acronyms, such as LULU (Locally Unwanted Land Use), NIABY (Not In Anybody's Back Yard), NIMTOO/NIMTOF (Not In My Term Of Office), NIMEY (Not In My Electoral Year/Yard), NOPE (Not On Planet Earth), NOTE (Not Over There, Either), BANANAs (Build Absolutely Nothing Anywhere Near Anyone), NUMBY (Not Under My Back Yard), which is used in the case of underground infrastructures, or CAVE (Citizens Against Virtually Everything).[152]

The literature about NIMBY can be divided into two categories: the analysis of the NIMBY phenomenon itself, and the response of the NGOs aimed at overcoming this pejorative label. The aim here is not to make an exhaustive review of the literature about NIMBY (which is almost impossible considering the proliferation of articles in various academic fields, from Science Studies to Urban Planning, through Political Sciences) but to introduce the NIMBY phenomenon.

In the analysis of the NIMBY phenomenon itself, scholars have explored the reasons of the mobilisation of the residents, and have made judgments about the impact of such a mobilisation on the decision-making processes. This literature can be levelled in two kinds of considerations of the NIMBY reaction. The first one is highly critical, these authors argue that essential projects have become impossible to site, restricting or delaying local economic

[152] See for ex. Inhaber H., 1992, Trom D., 1999, Heiman M., 1990. The origin of these acronyms is difficult to establish. It is unclear whether they were created by scholars, or actors concerned by the NIMBY issue. Most of the time, the scholars who use them do not identify their origin.

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development and technically superior solutions. They often condemn NIMBY actions as selfish, irrational, and costly to society (Glaberson W., 1988; Mazmanian D. and Morell D., 1990). As Michael Craft and Bruce Clary analysed, in this view of a phenomenon recognised as NIMBY, five reasons are conventionally attributed to the strong oppositional behaviour:

> *"(1) distrust of the project sponsors; (2) limited information about the sitting issue;(3) attitudes toward the project that are local and parochial, and which do not consider broader ramifications; (4) an emotional orientation toward the conflict; and (5) a high level of concern about project risks."*
>
> (Kraft M. and Clary B., 1991, p. 302-303)

The second kind of analysis of the NIMBY phenomenon is fairly positive and tends to invalidate the conventional view of the reasons of the NIMBY reaction. It suggests that the public's position is rational and legitimate and that the participation of the public in the decision process leads to better decision-making. These authors argue that citizens may have a good grasp of and reasonable concern for health and welfare, which are ignored by technical and administrative elites (see for ex.: Fiorino D., 1995; Matheny A. and Williams B., 1985; Kraft M. and Clary B., 1991; Hunter S. and Leyden K. M., 1995). From this literature, it follows that if, indeed, the public may be strongly opposed to the siting, citizens are moderately well informed and able to discuss an array of technical problems. Furthermore, these scholars has found that if the "my backyard" is actually present, this parochial outlook is not characteristic of the majority of those testifying, and "highly emotive" statements are not that spread. With regard to the lack of trust and confidence in the government agency, these scholars conclude that it can often be considered as a rational assessment of prior performance and credibility of the government agency.

In order not to be accused of NIMBYism, with its pejorative sense of egoism, militants set up strategies to demonstrate that by fighting for their own interests, they are defending the common good. In the academic and 'grey' literature, it is possible to distinguish three kinds of strategy. A first strategy is to try to transform the NIMBY into what I label Local Inappropriate Site Use (LISU).[153] The militants try to show that the site has special features that make it unique and unsuitable for the setting up of the facility. For example, the argument can be that the site is a refuge for migratory birds, that it shelters protected species, that it is

[153] About LULU and NIMBY, see Popper F. J., 1987

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next to a residential area, or that it is one of the rare green sites remaining in the city. This corresponds to a sectional distribution of activities in space: each zone of geographical space has its own function, for example, an industrial facility must be set up in an industrial and not in a residential zone.[154]

A second strategy is to transform the NIMBY into a Not-In-Anybody's-Back-Yard (NYABY) position, which is also labelled as NOPE (Not On Planet Earth) by the American environmentalists, or again NOTE (Not Over There, Either). The militants try to overcome the suspicion of egoism through an attempt of generalisation of the problem (see, for example, Gordon C. and Jasper J. M., 1996, Lolive J., 1997). They do not argue that they are simply opposed to the facility next to their home, but that such a type of facility should not be built in any place because of its intrinsic dangerousness. Such an argument is typically used for facilities which possibly pose a hazard to health, such as household waste incineration plants or nuclear power plants. The criticism is not addressed to a facility sited in a given place, but to a dangerous technology without further reference to geographical location.

A third and far more radical strategy is the BANANA (Build-Absolutely-Nothing-Anywhere-Near-Anyone), also labelled CAVE (Citizens Against Virtually Everything). Such an argumentation consists of the opposition to every instance of proposed new infrastructures. However, rather than a claimed strategy, BANANA is more often used (by the decision-makers) to criticize the opposition of interest groups to land planning. In other words, it labels the opponents as opposed to the (technical) progress.

Recognised NGOs

The local NGOs could make '*references to recognised national or international NGOs*', such as Greenpeace, WWF, *CNIID*, or *France Nature Environnement*. These NGOs enjoy '*moral credibility*' in the views of the wider public because of their past analysis, positions and actions. They enjoy a good reputation in the opinion of the public and are recognised as a defender of the common good, especially the NGO Greenpeace (see for example Galinon M.-

[154] The substance of the LISU concept has been strongly inspired by Dany Trom (Trom D., 1999, p. 38-39). However, He limits his concept to a spatial distribution of human activities. Each area has its own function: industrial facilities must be set up in industrial zones and residence in residential ones. Furthermore, he labels this concept as LULU (Local Unwanted Land Use). The term LULU was first coined by F. Popper in 1981 (Popper F. J., 1981), and in the sense of Popper, the term LULU is synonymous with NIMBY (see also Inhaber H., 1992). In fact, Dany Trom has used the term LULU in the sense that may be found in the grey literature: Local Unadapted Land Use (see for example Grelet S., 2007). Inorder to avoid any confusion, I will not use the term LULU at all, and I will use the term LISU.

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P., mémoire P. Chastenet S. Milacic directeurs, 2000). In this case, at various degrees, these NGOs stand against household waste incineration generally speaking; they are again the setting up of new incineration plants (as I have stated in chapter 3, *FNE*, however, agree with the setting up of new incineration plants under certain conditions). Being national in scope and nature, these NGOs can not be accused of Nimbyism.

Juridical Arguments

Local NGOs could resort to a third type of argument, which have a strong '*moral credibility'* in the societies ruled by the laws: the '*juridical arguments*'. Two types of '*juridical arguments*' can be distinguished: the regulatory norms, which have a '*legislative authority'*, and the sentences, which have a '*judicial authority'*.

The '*sentences*' are the decisions made by court, in the present research about the compliance with law of a given incineration plant or incineration plant project. Most of the time, these are sentences of civil legal actions undertaken by the local NGOs. These legal actions concern procedural aspects of the decision-making, such as the authorisation to build. However, some local NGOs have also undertaken criminal actions concerning the possible poisoning of the residents by an incinerator.

Concerning the '*regulatory norms*' that the local NGOs could use, a series of European directive establish the authorised level of pollutants emissions or the necessary filtering equipments.[155] These European Directives are: 2000/76/EC of 4 December 2000, 1999/90/EC of 22 April 1999, and 96/61/EC of 24 September 1996, 89/369/EEC and 89/429/EEC, and 75/442/EEC of 15 July 1975. The aim of the directive 2000/76/EC of 4 December 2000 on the "incineration of waste" is *"to prevent or to limit as far as practicable negative effects on the environment, in particular pollution by emissions into air, soil, surface water and groundwater, and the resulting risks to human health, from the incineration and co-incineration of waste"* (preamble § 5). This *"aim shall be met by means of stringent operational conditions and technical requirements, through setting emission limit values for waste incineration"* (art. 1). Notably, measurements of the following substances, NOx, provided that emission limit values are set, CO, total dust, TOC, HCl, HF, and SO2, shall be carried continuously (art. 10, § 2a), excepted under certain circumstances. The Directive

[155] It should be noted that the '*credibility*' of the regulatory norms stems from the support of scientific arguments. However, I make the hypothesis that the local NGOs actually make reference to the '*judicial authority*' of the regulatory norms.

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1999/30/EC of 22 April 1999 is related to limiting values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air. Council Directive 96/61/EC sets out an integrated approach to pollution prevention and control, and all the aspects of an installations environmental performance are considered in an integrated manner. The Directive 96/61/EC repeals Council Directives 89/369/EEC and 89/429/EEC on the prevention and reduction of air pollution from municipal waste incineration plants.[156] Finally, directive 75/442/EEC encourages the prevention or reduction of waste production and its harmfulness and the recovery of waste by means of recycling.

In light of the rule of law principles, it would be difficult for the supporters of incineration to deny the '*judicial authority*' of judges or the '*legislative authority*' of the legislators. In the present case, it is unlikely that the regularity norms about incineration or the sentences concerning the non-respect of the procedures are accused of defending personal interests.

The methodology used to deal with the gain of 'credibility' is qualitative. The data consist of the documents published by the NGOs and which were addressed to the wider public and/or to the public authority. The data analysis method is inspired by the grounded theory methodology, and resorts to the software Atlas-ti. More details about the methodology can be found in the section IV of chapter 8.

V.Summary-Conclusion

In this chapter, three different theoretical frameworks have been set up to answer to the second set of three research questions which intends to evaluate the importance of scientific expertise for local NGOs. These three theoretical frameworks fall within the critical Public Understanding of Science theoretical perspective.

The theoretical framework for the research question number 4, which is about the reasons declared by the interviewees for not mobilising scientific expertise, consists of a typology developed by a critical PUS scholar Mike Michael (Michael M., 1996). This typology, based on the semi-structured interviews with members of the public in a local context, identifies three types of reason invoked by the interviewee for not mobilising scientific knowledge: '*mental constitution*', '*division of labour*', and '*deliberate choice*'. This typology will be

[156] I remind the reader that the cases studied started in the beginning of the 90's and finished between 2003 and 2005.

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confronted with the data collected in the context of this research, and then refined (see chapter 8, section II).

In order to deal with the sources of scientific expertise of the NGOs (research question N. 5), I have developed a property space of these sources. This property space is made up of two dimensions: the first dimension concerns the '*qualification*' of the expert ('*certified'* or '*experience-based*') while the second dimension concerns the belonging of the expert ('*internal*' or '*external*') to the NGO. Furthermore, the '*external'* expert is divided in four categories: private laboratories, public laboratories or institutions, stage agencies, and other NGOs. Since, there is almost no study about the sources of scientific knowledge mobilised by the public, this property space is innovative. It will be refined in the light of the empirical study. The result of this refinement will be the setting up of a typology of the sources of scientific expertise used by the NGOs in the 10 selected decision-making processes (see chapter 8, section III).

Concerning the final research question, which is about the use of *'scientific expertise'* in the discourses of the NGOs, the theoretical framework is a list of five types of arguments that the local NGOs could use to gain '*credibility*', and consequently to strengthen their position.. '*Scientific expertise*', which benefit from the '*cognitive credibility*' of science, could be a key argument in the framework of the technical-scientific decision-making processes studied here. At least, I intend to evaluate the importance of '*scientific expertise*' as an argument to convince the wider public and the public authority. To confront the '*cognitive authority*' of science, actors such as the local NGOs could adopt four alternative strategies, which can be combined: '*mobilisation*', which consists of a selection of determined scientific expertise;. '*challenge*', NGOs question the authority of science and propose an alternative source of knowledge; '*demarcation*', NGOs try to limit the authority of science by pointing to uncertainties in the state of knowledge and/or to conflicting theories/evidence; and 'complementary', NGO identify complementary forms of expertise which are non-scientific.

In a complementary strategy, NGOs could resort to four arguments. A first one could be the '*precautionary principle*' in order to overcome the lack of cognitive credibility of science in the eyes of the wider public due to the uncertainties around the adverse effects on health of incineration plants. The three other arguments allow the NGOs to gain '*moral credibility*', that is, they tend to show that the NGOs act for the common good, and not (only) for personal interests. These are: '*overcoming the NIMBY label*', '*recognised national or international*

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NGOs', and '*juridical arguments*'. This list is hypothetical (the NGOs may or may not resort to these arguments) and is not exhaustive. As a final point, this theoretical framework is novel, and it will be refined or modified in the light of the empirical study.

While for the research question concerning the declaration of the NGOs about their ignorance the theoretical aim is to test and improve an existing theory, for the two other research questions the aim is to build rather than to verify a theory. Thus the respective theoretical frameworks I have set up are hypotheses rather than firm theories. The empirical study will actively contribute to the building of the two theories.

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Chapter 8
Sources of Scientific Expertise of the NGOs

It should be borne in mind that among the various pollutants released by incineration plants, dioxins and furans are the molecules which worried the most the residents. Indeed, while it is acknowledged that dioxins and furans have adverse effects on health, there are uncertainties about the link between exposure to dioxins emitted by incineration plants and effects on health. In this context, I look at the importance of scientific expertise for the local NGOs engaged in the ten decision-making processes. This chapter aims to answer the research questions concerning the sources of scientific expertise: "4. To what extent do local NGOs seek scientific expertise; what are their sources?"; "5. what are the reasons invoked by the local NGOs for not mobilising scientific expertise?" More precisely, it intends to answer the following questions: what type of scientific expertise was sought; why was it sought and by whom; what were the reasons for not seeking the expertise; have the actors who sought the expertise succeeded in obtaining it; and what were the reasons for failing to obtain the sought-after expertise?

Let's start with some definitions about the '*mobilisation*' of scientific expertise. First, there are the NGOs which sought and those which did not seek expertise. Then, among the NGOs which sought expertise, there are those which succeeded and those which failed to obtain the sought expertise. The NGOs which succeeded in obtaining the sought expertise are designated as NGOs which 'mobilised' expertise. In the light of the empirical study, it has appeared that the NGOs sought expertise in two manners. The first manner is the one already discussed in the theoretical chapter: the local NGOs sought the expertise themselves. The second manner

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has appeared during the empirical study: the local NGOs requested it from their public authority. From now and onward, the first manner is labelled '***direct mobilisation***' of scientific expertise and the second one '***indirect mobilisation***'. In this chapter I make a classification of these requests, assessing when the public authorities granted them or not. As I have already stated in the previous chapter, two categories of NGOs which did not mobilise expertise can be distinguished: the NGOs which did not seek expertise and those which failed to obtain the sought-after expertise.

Again in the light of the empirical study, it seems that there is a correlation between the type of NGO ('*ad hoc*'-'*existing'*) and the mobilisation/no mobilisation of scientific expertise by these NGOs.

From the empirical study it appears that the definition of scientific expertise I have established in the previous chapter must be supplemented. The interviewees make a big difference between the scientific expertise concerning their incineration plant and the more general scientific expertise. Consequently, I distinguish two further types of scientific expertise: '*general'* and '*local'*. '***General scientific expertise***' is made up of scientific reports, expertises, or discourses held by experts, which are not about the case the local NGOs are directly concerned with. '*General*' expertise covers general scientific background knowledge (about dioxins and impact of incineration on the environment and on health), and the pre-existing expertises carried out in other locations. General expertise does it imply that specified scientists or laboratories are requested to deliver reports to the NGOs; NGOs simply read the existing reports. '*General scientific expertise*' can be, for example, an epidemiological study about another case published in a scientific journal, a report on the state of knowledge concerning dioxins, or a conference about the risks of waste incineration. '*Local scientific expertise*' typically consists of the measuring of dioxins emitted by the incineration plant the local NGO deals with. The measuring is typically made in the soil, vegetation and animals surrounding the incineration plant and in the blood of the residents. '***Local scientific expertise***' consists of original scientific reports, expertises, or discourses held by experts, concerning the incineration plant the local NGOs are directly dealing with. *'Local'* here applies to the geographic location of the ground of analyses and not to the geographical location of the laboratory. '*Local*' does not apply to the type of analysis performed either: they can be mere measurements of dioxins in the environment or more complex epidemiological studies. However, '*local scientific expertise*' can also be local epidemiological studies. For these two types of scientific expertise the sources are, in principle, the same, that is: private laboratory, public laboratory, research institution or

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researcher, state agency, and NGOs. For most of the local NGOs scientific expertise is synonymous with '*local*' scientific expertise.

This chapter is divided into seven sections. The first section introduces the methodology. In section II an overview of the sources of scientific expertise is stated. Section III deals with the '*general*' expertise sought and section IV with the '*local*'. In section IV, I look at the relationship between the type of NGO ('*ad hoc*'/'*existing*') and the direct mobilisation of expertise. Section VI tackles the reasons of the NGOs for not mobilising scientific expertise. Finally, section VII is a bit aside from the analysis of the sources of scientific expertise of the local NGOs since it deals with the strategy if the NGOs to overcome the NIMBY label. Indeed, during the interviews, the NIMBY issue spontaneously popped up. Since this issue was important for the local NGOs and since it was already studied in the theoretical framework, I have decided to analyse this phenomenon.

I. Methodology

Selection of the NGOs

The NGOs selected are all the (local) NGOs which engaged in the 10 decision-making processes, that is, 25 NGOs. However, as I have already stated in chapter 3, it has not been possible to carry out the interviews with three NGOs. So, finally, 22 NGOs have been studied.

Data Collection Methods

The data collected are the answers to the topics number 11, 12, 13, of the semi-structured questionnaire (see the appendix "Questionnaire for the NGOs"). The questions concerns the sources of scientific expertise the NGOs turned toward. I asked for example for question N°11: "Did you search for scientific expertise about the impact of incineration on health? Did you ask the public authority for the carrying out of scientific expertise concerning the impact on health?" The two other questions are similar, but they concern two other domains of expertise: question N°12 concerns the impact on the environment, and N°13 the measurement of the emissions of pollutants.

Since the interviews were semi-open; I had to re-formulate the questions in various ways in order to get the sought data. For example, the term "scientific expertise" or even "scientific knowledge" sometimes hindered the gathering of the data I sought: some interviewees had in mind a very different definition of scientific expertise from the one I have defined for this

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research, and they often answered me that they did not search for scientific knowledge or scientific expertise, even if in fact they did. NGOs tended to consider scientific expertise or scientific knowledge only as '*certified local expertise'*, and to exclude '*certified general expertise*', and '*general'* and '*local'* '*experience-based expertise*'. So, I had to manage this important discrepancy between my definition of '*scientific expertise*', and those of the interviewees, reformulating my question. Among others, a solution was to ask again the question but replacing the term "scientific expertise" by the terms "information" or "studies". For example, question N.11 became: "Did you search for information about the impact of incineration on health? Did you ask the public authority for the carrying out of studies concerning the impact on health?" (see the appendix "questionnaire for the NGOs"). These two terms, which are more general and vaguer than "scientific expertise", enabled me to collect the data I was searching for. Of course, using such terms, I have also collected data which are not relevant for the present research, that is, data which did not correspond to the definition of ('*experience-based*'/'*certified*') '*scientific expertise*' I have set up in this research.[157] The restrictive definition of scientific expertise of the NGOs implies that they were interested in certified knowledge concerning (the impact on health and the environment of) their local incineration plant.

I have made the distinction among the domains of expertise – health, environment, and emission of pollutants – on the basis of the initial open interviews, of information concerning I found on the web sites of the NGOs (Greenpeace, *FNE*, *CNIID*, and local NGOs), and on the web sites of various institutions (French Ministers, European Commission, French State Agencies). I thought that I would have had more accurate answers if I divided my questions according to these four domains. However, the answers were often mixed up: many interviewees answered in the same time to questions 11, 12, and 13, when I asked question N°11. It has not been, however, a problem for the data treatment. In the cases in which the NGOs did not mobilise scientific knowledge, the interviewees spontaneously explained the reasons why; I did not have to ask the question: for which reason did not you resorted to scientific expertise.

[157] It should be remembered that, in this research, '*scientific expertise*' means: "the analysis of a specific natural phenomenon or technological object using physical, chemical or biological knowledge. A '*scientific expertise*' is an application of scientific fundamental knowledge in a particular context". I remind the reader also that I distinguish two types of scientific expertise: '*experienced-based*' and '*certified*'. See chapter 7, section II for further details.

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When available, the data gathered through the interviews have been verified and completed by the documents and web sites the NGOs published, (see the appendix "Sources of Data").

Data Analysis Method

The analysis of the mobilisation of scientific expertise is based on the property space of the sources of scientific expertise that I developed in the previous chapter (sub-section II.2). The individual sources of scientific expertise of the NGOs have been listed and then distributed in this property space. Each type of sources is commented on the text, and the relative importance of the sources are assessed and discussed.

The analysis of the trust of the NGOs in the sources of scientific expertise is analysed on the basis the sources the NGOs actually selected: NGOs mobilise scientific expertise they trust.

The analysis of the reasons of the NGOs for not mobilising for scientific expertise is based on the declaration of the interviewees: either they declared that the NGO did not mobilised scientific expertise, or they made the list of the scientific expertise they mobilised. When a NGO declared that it did not mobilise scientific expertise, I have tried to identify the reasons why it did not seek scientific expertise. The development of the typology is supported by a series of quotations from the answer to the questions N°11, 12, 13, and 14 (see the appendix "Questionnaire for the NGOs"). I have directly translated these quotations from French to English.

I have attributed a number (from 1 to 22) to each of the 22 NGOs. Since the NGO '*Nord Nature*', the only NGO engaged in the case of *Arras* (case N°4), did not answer to these questions, the case has been removed from this analysis of the sources of scientific expertise of the NGOs.

II. Mobilisation of Scientific Expertise: an Overview

As tables 10 and 11 below show, most of the NGOs sought scientific expertise: only three out of the twenty-two NGOs did not seek scientific expertise, while nineteen did. The NGOs equally sought local and general expertise: almost the same number of NGOs sought local expertise (14) and general expertise (12). All the NGOs which sought '*general*' expertise did it directly. Conversely, the NGOs mainly sought '*local*' expertise in an indirect way: fourteen requested to their public authority for the carrying out of scientific expertise, while only four NGOs directly sought expertise.

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Table 10. Mobilisation of scientific expertise by the NGOs

NGOs	No seeking of scientific expertise	Seeking of scientific expertise		
		General expertise	Local expertise	
		Direct mobilisation	Direct mobilisation	Request to the public authority
1. *VPIG*		X		
2. *Autun Morvan Ecologie*		X		
3. *Collectif Inciner'àtort*		X		
4. *AREN*		X	X	X
5. *Collectif Halt Incin'*		X		
6. *Thiviers la Vie*		X		
7. *CRITOM*		X	X	X
8. *Ecologie Pour Le Havre*				X
9. *SOS Estuaire*				X
10. *Comité du quartier des Neiges*				X
11. *Compiègne Ecologie*	X			
12. *Alerte aux Déchets*		X	X	X
13. *Coordination Environementale des Pyrénées Orientales*				X
14. *La Hune*		X		X
15. *Charles Flahaut*	X			
16. *Guichainville Environnement*				X
17. *La Sauvegarde de l'Environnement*				X
18. *ASMSN*	X			
19. *Association des Médecins de Maincy*		X		X
20. *Un autre regard pour Maincy*				X
21. *AVIE*		X	X	X
22. *AIPPNE*		X		X
Total	**3**	**12**	**4**	**14**

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Table 11. Mobilisation of scientific expertise by the NGOs: frequency table

	No seeking for Scientific Expertise	Seeking for Scientific Expertise			
Number of NGOs	3	19			
	-	General Expertise		Local Expertise	
	-	12		14	
	-	Direct Mobilisation	Request to the public authority	Direct Mobilisation	Request to the public authority
	-	12	0	4	14

III. Seeking General Scientific Expertise

Among the 12 NGOs which mobilised general scientific knowledge, three (N°2, N°14, and N°19) were not able to remember precisely the sources they used; they were just able to distinguish between '*local*' and '*general*' expertise. In other words, nine NGOs were able to specify the sources they resorted to. From table 12 below, it appears that these nine NGOs resorted to two out of the four types of sources of scientific expertise defined by the property space: '*certified external'* and '*experienced-based external'*. No NGO tried to produce '*general*' expertise internally. It is likely that the local NGOs simply do not have the internal capacities to produce such expertise: epidemiological studies or measuring of dioxins are difficult and complex to produce; they require very costly equipment and highly specialised competencies. However, the NGOs did not resort to these two types to the same extent. The sources of scientific knowledge of the twelve NGOs are detailed in the text and synthesised in table 12 below.

Certified External Expertise

Eight of the 22 interviewed NGOs (NGOs N°1, 3, 4, 5, 6, 7, 12, 21) declared that they resorted to some scientific expertise produced by certified external expert. Among the '*certified external*' sources, it has been more difficult to obtain clear and detailed information about the bibliographical studies than about the other types of sources. Most of the interviewees were not able to precisely quote the sources they used. The reason invoked by the interviewees was either that they do not remember anymore because the facts occurred a

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long time ago, or that this is another member of the association who deals with the scientific issues. In some cases, the interviewee searched back in his document the sources they referred to. The NGOs mainly resorted to bibliographical scientific references, but conferences made by scientists were mentioned too.

The interviewees were able to quote precisely (i.e. at least two of the three following elements: title, author, year) only three bibliographical sources. The first one, the most quoted (6 times by the NGOs N°1, 2, 3, 5, 6, and 7), has been produced by a group of French medical academics, and is about the French incinerator of the town of *Besançon*; the leader of this group, Professor Viel, is an Epidemiologist. This study is an epidemiological study on soft–tissue sarcoma and non-Hodgkin's lymphoma clusters around a municipal solid waste incinerator with high dioxin emission levels.[158] By the way, the national NGO *CNIID* distributed this study among the local NGOs members of its net.[159]

Table 12: The sources of '*general*' scientific expertise of the eleven NGOs

The second source quoted is a state research institute, the *Institut National de la Santé et de la Recherche Médicale*, *INSERM* (National Institute of Health and of Medical Research). *INSERM* is the only French state institute fully dedicated to the research in biology, medicine and the health of population. It has published two reports about dioxins: in a report on the dioxins in the environment and their dangers for health in 2000, and a report on the risk of congenital malformations next to incineration plants in 2002. [160] But these two reports have been very little used by the local NGOs: they have been quoted only by N°7 and N°21, respectively. With the data I have collected, it is not possible to know the reason why these NGOs did not mobilise these expertise: did they consider them as useless or untrustworthy, or did they simply ignore their existence?

[158] Viel JF, Arveux P Baverel J Cahn JY, "Soft–tissue sarcoma and non-Hodgkin's lymphoma clusters around a municipal solid waste incinerator with high dioxin emission levels", *American Journal of Epidemiology*, 2000, p. 13-19.
[159] See chapter 3, sub-section III.3 for further details about the local NGOs member of the *CNIID*'s net.
[160] Institut National de la Santé Et de la Recherche Médicale, *Dioxines dans l'environnement : quels risques pour la santé ?*, INSERM, Paris, 2000.
Institut National de la Santé Et de la Recherche Médicale, Evaluation du risque de malformations congénitales liées a la proximité d'incinérateurs d'ordures ménageres, 2002.

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Table 13. Sources of '*general*' expertise of the eleven NGOs

	Internal	External			
		Private Laboratory	**Public laboratory /research institution/researcher**	**State Agency**	**NGO**
Certified	**0**	**0**	**8 NGOs** N°1 : conf. Prof Belpomme, conf. prof. Narbonne; conf. Pluyghers, conf. Reno, study Viel N.3 : study Viel, conf. Lainé N.4 : study Viel N.5 : conf. Prof. Mouton, conf. Belpome, Viel (M6) N.6 : Study Viel, Prof. Belpomme, other sources N.7 : Inserm, articles prof. Viel, articles prof. Narbonne N.12 : a member of Institut Curie, through physicians, biologiss, chemists, members. (undetermined) N.21 : Inserm 2002, SFSPViel	**1 NGO** N.4 : DRIRE	**1 NGO** N°7: Study WWF "Detox"
Experience Based	**0**	**0**	**0**	**0**	**3 NGOs** N.3: conf. Sarazin N.5: conf. Neuhor (CNIID), conf. Vicaire (Greenpeace), conf. Dietman, conf Sarazin, conf. Nicolas; CNIID important source of information N°7 : CNIID and Greenpeace important source of information
N.X (X from 1 to 22), identifies the twenty two interviewed NGOs by a number NGOs N.2, N.14, and N°19 mobilised some general scientific knowledge but were not able to remember the sources Conf. is for 'conferences'. Most of them organised by the NGOs themselves					

The third bibliographical source quoted is a report published by an NGO which the members are academics in the medical and biological fields (i.e. certified experts): the *Société Française de Santé Publique* (French Society of Public Health). This report consists of an assessment of the knowledge concerning the sanitary impact of waste incineration and was published in 1999. It has not been really a reference for the NGOs since it has been quoted

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only by one NGO, the NGO N°21. With the data in my hand, however, I have no idea about the reasons why such a source has so seldom been used.

A series of vague references to diverse studies have been made by some NGOs. One NGO talked about a "Belgium study concerning dioxins in blood next to an incineration plant" and about "an American study", N°7 about a paper by Professor Narbonne, and another one about a paper published by Prof. Belpomme.

In four different cases, four local NGOs (N°1, 3, 5, and 6), declared that they obtained some information on the environmental or sanitary impact of incineration through conferences (three out of these four NGOs organised themselves the conferences). The contributors of these conferences were certified medical academics: Professor Belpomme, Oncologist (2 conferences); Professor Narbonne, Toxicologist (1); Prof. Mouton, Toxicologist (1); Jean Reno, academic (1), Dr Pluyghers, Belgium Oncologist (1), and Dr Lainé (1).[161]

To finish, only one NGO declared that it used a report on the annual emissions of pollutants of running incinerator written by DRIRE (the Direction Régionale de l'Industrie de la Recherche et de l'Environnement) and initially produced to calculate the pollution tax.[162] No NGO quoted the study carried out by the *Institut National de Veille Sanitaire* about the exposure of the residents living next to household waste incinerators (Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2003), nor the report made of 65 questions about dioxins and incinerator (Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2005). The conclusions drawn from these studies and reports are mainly in favour of the NGOs'position. In short, these studies conclude that waste incineration might be dangerous for health and that further studies are necessary to be able to draw straight conclusions. It is likely that these studies and reports were published too late to be really used by the local NGOs: between 2003 and 2005, some of the studied decision-making processes were already finished, and the other ones were at their *'realisation'* stage, everything was already decided and the NGOs were little active. The other studies carried out by the two states agency which deal with this issue, *INVS* and *AFFSA* could not be quoted since they were published after the end of the studied decision-making

[161] The number in brackets is the number of NGOs concerned, which correspond also to the number of conferences since, for each NGO, the external contributor came only one time.
[162] Let us note here that DRIRE is not a state agency but a regional technical department at disposal of the state services. However, due to its 'state nature' and because it has been quoted only one time, I did not create an ad-hoc category for DRIRE and I have included it in the 'state agency' category.

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processes (Institut National de Veille Sanitaire, 2006a; Institut National de Veille Sanitaire, Agence Française de Sécurité Sanitaire des Aliments, 2006b).

Experience-based External Expertise

Only four NGOs (N°3, 5, 7, 22) resorted to '*experience-based external*' expertises, which were '*general'* expertises. Through the conferences they organised, three local NGOs (N.3, N.5, and N.7) resorted to members of other NGOs as experienced-based expert. Moreover, even if they did not formalise it, the interviewed NGOs made the difference between certified experts and experience based experts, as NGO N.5 put it "*we organised public meeting with members of NGOs who are not experts but who have some competencies*" (interview N°5 *Collectif Halt Incin*'). Furthermore, from all but one interview (N°5), it is unclear whether the interventions of these members of association were principally about sanitary issue or about technical issues. When I asked the question about the link incineration-health or incineration-environment (Q.12, and Q. 13), the names of the members of NGOs popped up, but then, the interviewees were not able to specify the content of the interventions the contributors. However, they were able to quote the names of these contributors: P.E. Neuhor, president of the national NGO, *CNIID*, Y. Vicaire, responsible "toxicity" in the French national branch of Greenpeace, and M. Sarazin, petrochemist engineer, vice-president of a local NGO named APEL. Moreover the national NGO *CNIID* was quoted six times as distributor of existing scientific expertises, notably of the epidemiological study realised by professor Viel. In this role of distributor the local NGOs *EUGENE* and the national *Générations Futures* have been respectively mentioned one time.

Concerning the resort to certified expertise produced or ordered by other NGOs, an astonishing fact is that a '*certified*' scientific report, made by the Greenpeace Research Laboratories, which is based at University of Exeter (UK), "State of Knowledge of the Impacts of Waste Incinerators on Human Health" initially written in English and then translated into French in 2001, has not been even mentioned by any of the interviewee.[163] Only one NGO mentioned *"a document realised by WWF about blood analysis"* (interview N°7, *CRITOM*). In fact, this is likely to be the "DETOX campaign", realised between 2003 and 2006 by WWF. This campaign consisted in measuring out 101 chemicals, among which

[163] English version: Michelle Allsopp, Pat Costner and Paul Johnston Greenpeace Research Laboratories University of Lexter UK, 2001; French version: Michelle Allsopp, Pat Costner and Paul Johnston Greenpeace, 2001.
Let's note that any reference to the status of academics of the authors has disappeared in the French version.

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PCBs, in the blood of 47 European citizens. This campaign was not specifically about incineration, but about more generally about chemical contamination.[164] Thus national or local NGOs were not sources of scientific expertise for the local NGOs. However, six local NGOs (N°2, 5, 7, 11, 16, and 22) declared that Greenpeace, and above all *CNIID* played an important role as media to gain some certified scientific expertise.

Summary-Conclusion

The nine NGOs which mobilised general scientific expertise about the impact of incineration on the environment or health, and which were able to quote their sources, mainly turned toward '*certified external*' scientific sources. These '*certified external*' expertises were largely produced by public institutions or researchers linked to public institutions. The epidemiological study carried out by Professor Viel is the most popular, likely because it was the only French epidemiological study concerning incineration plants at that time, and because it has been spread through the national net *Coordination du CNIID*. As for the state agencies, *INVS* and *AFSSA,* they were not quoted. However, this absence is very likely due to the fact that the publications of these agencies were quite late (2003, 2005, 2006, and 2006), that is, around or after the end of the studied decision-making processes (end between 2003, and 2005). From this research, it is thus not possible to draw any conclusion about the trust of the NGOs toward these agencies.

Surprisingly, national or international NGOs were not a preferred source of scientific expertise at all for the local NGOs, whether the expertise was '*experience-based*' or '*certified'*. Furthermore the NGOs which resorted to '*experience-based*' scientific expertise also resorted to certified expertises produced by public entities. To a certain extent, the NGOs *CNIID* and Greenpeace were media through which local NGOs received some (certified) scientific expertise.

As for the absence of production of '*internal'* scientific expertise, it is likely due to the lack of competencies within the NGOs.

To conclude, in almost each decision-making process, at least one NGO sought '*external general certified scientific expertise*', produced by public institutions or by officially

[164] See the WWF web sites (last access 12th May 2008):
http://www.panda.org/about_wwf/where_we_work/europe/what_we_do/epo/initiatives/chemicals/detox_campaign/index.cfm
http://www.wwf.fr/campagnes/detox

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accredited laboratories. As many science studies scholar claim, this means that public (here local NGOs) engagement is likely to contribute to solving the problem of traditional expertise in public decision-making processes (see chapter 1). More particularly, the participation of the local NGOs is likely to solve the problem of the inadequacy of traditional scientific expertise, that is, the problem of the framing of the issue under discussion, as claimed by Jasanoff (1995, 2003) and Goodwin (1994).[165] Indeed, the local NGOs searched for information about an issue very little considered by the local decision-makers and their experts: the sanitary risks and the environmental pollution entailed by waste incineration. A participation of the local NGOs from the first stage, that is, from the outset of the decision-making processes, would have probably contributed to a wider framing of the issue. This result supports the position of Nowotny, Scott, and Gibbons (2001), who argue that the plurality of expertise brought by the public contributes to the production of a more '*social robust knowledge*'.[166]

The fact that the NGOs sought expertise which is '*certified*' means that the NGOs rather trust the official system of production of scientific expertise. A hypothesis, corroborated by the declarations of a few interviewees, is that the NGOs wanted to rely on scientific expertises which could not be questioned by the public authorities. In terms of 'boundary work' (Gieryn T. F., 1983; Gieryn T.F., 1995, the aim of the NGOs was probably to avoid that the public authorities resort to a strategy similar to the '*expulsion*' strategy, that is, that the public authorities try to bring discredit the expertises mobilised by the NGOs, qualifying these expertises as 'deviant', 'amateurish', or 'pseudo-science'.[167]

[165] See chapter 1 for more details
[166] See chapter 1
[167] See chapter 7 section IV.2 for further details about the boundary work.

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IV. Seeking Local Scientific Expertise

As I have already stated, only a few NGOs directly mobilised local expertises while many requested to their public authority for sponsoring local expertises.

IV.1. Direct Mobilisation

As table 13 below shows, three NGOs directly mobilised '*certified external expertise*', while only one tried to produce an '*internal certified*' and one an '*internal experience-based*' expertise.

Certified Internal Expertise

Only in one case did a member of an NGO (N°19), composed of physicians, try to set up an epidemiological study, but the attempt failed because of the lack of support of the local physicians, and above all because of the absence of register of cancers. It is reasonable to make the hypothesis that the local NGOs have not produced any epidemiological or environmental studies because of a lack of internal competencies and of technical means.

Certified External Expertise

To get '*local'* expertise, the three NGOs N°7, 12, and 21 had recourse to private and public laboratories. In the three cases, the NGOs asked for the measuring of dioxins produced by an old incinerator, pre-existing to the new incineration plant project. First, NGO N°12 resorted to the private laboratory named Analytica in order to measure out the quantity of dioxins in the soil and in eggs around the site of an old generation incinerator. The NGO tried to ensure the legitimacy and the legal value of the analysis through a *constat d'huissier* made by a *huissier de justice*.[168] However, the interviewee was not able to disclose whether the laboratory was accredited or not for such analyses. As we will see later in this section, the accreditation of the laboratories is a key issue for the NGOs which ordered some analyses. The official accreditation gives a legitimacy to the analyses since the accreditation of the laboratories is delivered by an official organisation, the French Committee of Accreditation (*Comité Français d'Accréditation: COFRAC*).[169] The analysis revealed soil pollution by dioxins, but

[168] In France, a *Huissier de Justice* is a member of the legal profession whose responsibility includes, among others, formally bearing witness to events or situations (*constat d'huissier*).
[169] *COFRAC* was created in 1994. An accreditation is a proof of technical competences. The accreditation of a testing laboratory is made on the basis of the pertinent standard in the NF EN 45000 series and a certification of

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they were emitted by a chemical industry, and not by the old incinerator. As for the eggs, no pollution was showed. So the results had not been put under discussion by the public authority.

Table 14. Mobilisation of '*local*' expertise by the NGOs

	Internal	**External**			
		Private Laboratory	**Public laboratory /research institution/researcher**	**State Agency**	**NGO**
Certified	**1 NGO** N.19 : epidemilogical study attempt	**1 NGO** N.12 : Analitica + Huissier	**2 NGOs** N.7 : D.S.V. + Institut Pasteur N°21 : huissier + CART	**0**	**0**
Experience Based	**1 NGO** N.22: emission flow calculation	**0**	**0**	**0**	**0**
N.X (X from 1 to 22), identifies the twenty two interviewed NGOs by a number.					

Second, NGO N°7 sponsored the measuring of dioxins in the fat of one cow. But the public authority rejected the validity of the analysis arguing that, even if the veterinary was accredited by the *Direction des Services Vétérinaires* (Veterinary Services), he was not accredited for the carrying out of fat-taking procedure. Furthermore, the public authority argued that the public laboratory, the *Institut Pasteur of Lille* was not accredited for such analysis. According to the interviewee, the difficulty was that "*no laboratory in France was accredited at that time to do this analyse because the accreditation to do these measuring out of dioxins in the food did not exist.*" (Interview N°7, *CRITOM*)

Third, following a donation, NGO N.21 ordered the analysis of 10 blood sample to quantify dioxins. This NGO searched for months an accredited laboratory in order to produce a non questionable analysis. Finally, after having searched in various European countries, the NGO found the Belgium accredited laboratory *CART (Centre d'Analyse des Résidus en*

its quality management system on the basis of the ISO 9001:2000 (see the web-site of *COFRAC* for more details: http://www.cofrac.fr/en/cofrac/Distinction.htm).

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Traces de l'Université de Liège). The takings have been certified by a *huissier de justice*. Finally, the results, which show an over exposure of the residents, have been validated by the *Institut National de Veille Sanitaire*. Following these analyses, NGO N°21 has undertaken a legal action for poisoning. To overcome the problem of cost, in the framework of this legal procedure, the NGO asked to the magistrate the realisation of an epidemiological study. Finally air and eggs analyses, using dioxins as indicator, have been ordered by the judicial authority. At the time of the interviews the results of these analyses were not known.

Experience-based Internal Expertise

Only one NGO (N°22) declared that it resorted to experience-based internal expertise. The expertise was *'local'*, and it consisted of calculations about the flow of emission of pollutants released by the chimney of the local incineration plant.

Summary-Conclusion

To conclude, the main sources of the five NGOs which mobilised *'local'* expertise were '*externally certified*', and more precisely accredited laboratories. As it is explained in the following sub-section, the reason why only few NGOs resorted to laboratories is the cost of the analyses that the local NGOs can not afford. Another explanation for this little recourse to laboratories could have been that the NGOs wanted to ensure the recognition of the results by the public authority. But no NGO mentioned such a reason. Furthermore, as we have seen in order to ensure the recognition of the results by the public authority and/or by the law, the three NGOs who sponsored themselves *'local'* scientific studies searched for accredited laboratories for the analysis, and the witnessing of a *huissier de justice* or of an accredited veterinary for the taking.

The analysis of the research of local expertise is in favour of a probable constructive role of the public in top-down participation mechanisms. As I have already stated in chapter 3, the local NGOs were informed about the project at the beginning of the second stage. Consequently, Local scientific expertise has been sought during the second stage, the '*specification*' stage, or during the third stage. They concerned the old generation incineration plant, or the new incineration plant project. But, in principle, local expertises could be used from the beginning of the decision-making process in order to evaluate the state of the environmental pollution. Such an evaluation would be important especially when an old incineration used to run. In the framework of participation initiaves sponsored at the outset of

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the decision-making processes, the mobilisation of '*local*' expertise by the local NGOs would have probably contributed to a wider framing of the incineration waste issue.

IV.2. Expertise Requested to the Public Authorities

Most of the local NGOs (15 out of 22 in seven out of nine decision-making processes) requested to the public authority (the *Préfet* or the mixed-syndicate) for the carrying out of expertise. The requests concerned '*local*' expertises both about the local old and new incineration plants. Since the public authorities have not the internal competencies to carry out such expertises, they turned to external laboratories.

The reason why many NGOs requested their public authorities to carry out *'local'* expertise while very few of them themselves ordered *'local'* analyses to private or public laboratories is the cost. As I have explained in the introduction to part III, epidemiological or exposure studies are complicated and costly to carry out. Furthermore, even the simplest analysis, the measuring of dioxins, is expensive for a local NGO. The cost of such a measuring caries from 500€ to 1500€ according to the medium, which is too expensive for the budget of the local NGOs. As a matter of fact, while in the questions 11, 12, 13, and 14 about the sources of scientific knowledge I did not ask anything about the cost of the analyses, eleven out of the twenty two interviewed NGOs (see table 14 below) spontaneously talked about this issue: these NGOs clearly stated that they did not sponsor *'local'* expertise because the cost was too high for their budget.

The requests covered the entire range of the types of studies which enable the evaluation of the sanitary impact of an incineration plant that I have exposed in the introduction of Part III: epidemiological studies, exposure studies, and sanitary risk evaluation studies, to evaluate the incinerator impact on health; environmental studies to assess the pollution of the environment; and the measurement of the emissions of pollutants.[170] As I have already stated, many requests were not granted, so there is no source of scientific expertise for most of the requests. This is the reason why I deal with these request in a separate sub-section from the sources of scientific expertise of the NGOs. When the requests were granted, however, the types of sources of scientific expertise used in the previous section apply.

[170] for further details about these types of studies, see in the section I of this chapter: "*The Studies Which Can Be Set Up To Measure The Sanitary Impact Of A Household Waste Incinerator*"

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Table 15. The problem of cost for the mobilisation of *'local'* scientific expertise and the requests made to the public authorities

NGOs (designated by a number)	declaration about the problem of expertise cost	Mobilisation of *'local'* scientific knowledge	Request of *'local'* scientific expertise to the public authority
1. *VPIG*			
2. *Autun Morvan Ecologie*			
3. *Collectif Inciner'àtort*			X
4. *AREN*	X	X	X
5. *Collectif Halt Incin'*			
6. *Thiviers la Vie*			
7. *CRITOM*		X	X
8. *Ecologie Pour Le Havre*	X		X
9. *SOS Estuaire*			X
10. *Comité du quartier des Neiges*	X		X
11. *Compiègne Ecologie*			
12. *Alerte aux Déchets*		X	X
13. *Coordination Environementale des Pyrénées Orientales*	X		X
14. *La Hune*	X		X
15. *Charles Flahaut*			
16. *Guichainville Environnement*	X		X
17. *La Sauvegarde de l'Environnement*	X		X
18. *ASMSN*			
19. *Association des Médecins de Maincy*	X		X
20. *Un autre regard pour Maincy*	X		X
21. *AVIE*	X	X	X
22. *AIPPNE*	X		X
Total	11	4	15

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Even if some requests were made during the second stage, most of them were made mostly during the third stage, the *'realisation'* stage, when the opening of the new incineration plant became ineluctable. In other words, the NGOs made these requests once the opening of a new incineration plant became inevitable. As a result, these requests could not have an impact on the building-non building of the incineration plant. However, they have had an impact on the monitoring of the released of pollutants in the environment. When they could not prevent the building of a local incineration plant, the local NGOs tried to increase the monitoring of the release of pollutants. An existing pollution due to the old incineration plant could have an impact on the monitoring of the new one. This suggests mistrust in the operators and the authorities charged with the monitoring of the operators. Strictly speaking, these expertises are not part of the decision making process (to build or not to build) but of the societal control of the technologies-in-use. In substance, the local NGOs wanted some guarantees through further monitoring of the emission of dioxins, of the environmental pollution, and of the impacts on health. The requests are detailed below, and synthesised in table 15, also below. I do not analyse here in detail the refusals of the requests and their motivations in this sub-section; this is the subject of section I.5 below "reasons for not mobilising scientific expertise".

Epidemiological Studies

Six NGOs requested the carrying out of an epidemiological study of the population surrounding their incineration plant, respectively. In other words, the local NGOs wanted the carrying out of an expertise in their backyard. Four NGOs (N.8, 12, 20, and 22), in three decision-making processes, requested to the public authority (*Préfet* or mixed-syndicate) the realisation of an epidemiological study to evaluate the impact on health of the old incineration plant. These NGOs were afraid of the effects on health of long tern exposure to dioxins. NGO 21 did not ask the local public authority, but made the request directly to a judge in the framework of a legal action against the mixed-syndicate, while NGO 19 asked to the *DDAAS* (*Direction Départmentale des Affaires Sanitaires et Sociales*, Départementale Service of the Sanitary and Social Affairs). All these requests have been rejected.

Exposure Studies

The requests for exposure studies consisted of the measuring out of dioxins in blood, and/or in maternal milk around the local incineration plant site. While the requests for blood tests aimed to evaluate the impact of the old incineration plant, the request for maternal milk

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concerned the new incineration plant. Here again, these local NGOs sought '*local*' exposure studies. None of the requests has been granted.

Sanitary Risk Evaluation

Only one NGO asked for a sanitary risk evaluation study, which mainly consists of an exposure studies which the results are analysed in the light of the Reference Doses and/or Reference Concentrations. In the case of *Angers*, in the framework of the Local commission for information and monitoring, on the basis of the law on air,[171] the NGO *AREN* made a request to the *préfet* for the carrying out of a sanitary impact study concerning the old existing incineration plant.

The request was granted and the study was carried out by certified experts belonging to regional services of the state agency *INVS*. These experts were designated by the *DDAAS*.[172] The NGO *AREN* fully trusts the results of this study carried out by certified experts.

Environmental Studies

Environmental studies were the type of study the most requested: 11 NGOs requested such studies. Conversely to the epidemiological and exposure studies, most of these requests were granted (seven out of 11). The environmental studies consisted of four types of studies: the measuring out of dioxins in various mediums, the lichen biomonitoring technique, the impact study, and the establishment of the 'state zero'. These four types of studies are detailed below.

To start with, eight NGOs (N°4, 7, 12, 13, 14, 16, 17 and 21) requested the measuring out of dioxins in some of the mediums possibly contaminated, that is, soils, vegetation, air, cow's milk, and eggs. These demands concerned either the old incineration plant, the NGOs wanted to know the extent to which the old incinerator had contaminated the environment, or the new incineration plant, the NGOs wanted further monitoring of the releases of dioxins and other pollutants in the environment. Four demands concerned single analysis (NGOs N.4, 7, 16, 21) while four other requests (NGO 12, 13, 14, 16) concerned the setting up of regular analyses made on several mediums (soil, and/or air, and/or vegetation) in order to continuously assess the pollution of the environment. NGO N.16 made an original request: the setting up of a vegetable garden and a regular assessment of the contamination of the vegetables by dioxins;

[171] *Loi No 96-1236 du 30 décembre 1996 sur l'air et l'utilisation rationnelle de l'énergie*
[172] (Glorennec P., Zmirou D. and Peigner P., 2001) :Glorennec P., Zmirou D., Peigner P, Cellule Inter Régionale d'Epidémiologie Ouest, « Impact sanitaire passé et actuel de l'Usine d'Incinération des Ordures Ménagères d'Angers. Rapport », Rennes, 2001.

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Table 16. The requests of scientific expertises made to the public authorities

NGOs (designated by a number)	Types of studies				
	Health Effects			**Environmental Studies**	**Measurement of the Emission of pollutants**
	Epidemiological Study	Exposure Studies	Sanitary Risk Evaluation		
1. *VPIG*					
2. *Autun Morvan Ecologie*					
3. *Collectif Inciner'àtort*				Ref. (Impact study)	
4. *AREN*			Grant	Ref. (dioxins in soil)	Ref. (Communication of the continuous measurement)
5. *Collectif Halt Incin*'					
6. *Thiviers la Vie*					
7. *CRITOM*		Ref. (Blood test)		Grant. (Dioxins in soil and cow's milk, after 2 years); Ref. (heavy metal)	Grant. (continuous assessment)
8. *Ecologie Pour Le Havre*	Ref. (multiplicity of sources)				
9. *SOS Estuaire*					
10. *Comité du quartier des Neiges*		Ref. (Blood tests, cost)		Grant. (lichens)	
11. *Compiègne Ecologie*					
12. *Alerte aux Déchets*	Ref. (multiplicity of sources, no cancer register)			Grant. (regular in soil, vegetation and air)	
13. *Coordination Environementale des Pyrénées Orientales*				Grant (dioxins in soil, vegetation, and air; yearly then every two year)	
14. *La Hune*				Grant, (dioxins in soil and vegetation)	Ref. (comm.. conti. meas.)
15. *Charles Flahaut*					
16. *Guichainville Environnement*		Ref. (maternal milk)		Ref. (dioxins in vegetables and cow's milk,) N.A. (lichens)	Ref. (con.t dioxins)
17. *La Sauvegarde de l'Environnement*				Grant. (air) Ref. (state zero)	Grant. (communication cont. meas.)
18. *ASMSN*					
19. *Association des Médecins de Maincy*	Ref. (no cancer register)				
20. *Un autre regard pour Maincy*	Ref.	Ref. (blood tests)		Ref. (impact study)	Grant. (Owen cones)
21. *AVIE*	Ref. (through legal action)			Grant. (dioxins in air and cow's milk; through admin. Court.)	
22. *AIPPNE*	Ref. Ref. (cancer register)				Grant. (Owen cones)

Ref.: Refused by the public authority; Grant.: Granted by the public authority; N.A.: No Answer

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the request was not granted. This NGO also requested some cow's milk tests, also refused. However, in the same decision-making process, following the request of farmers, the mixed-syndicate granted a regular assessment of the dioxin contamination of cow's milk, soil, and rainwater. As well as for the epidemiological study, the NGO 21 made the request to a judge in the framework of a legal action against the mixed-syndicate.

Six out of the seven requests were granted (N°7, 12, 13, 14, 17 and 21) and two rejected (N°4 and 16). When granted, only two NGOs had the possibility of participating in the selection of the laboratory. The laboratories selected were officially accredited (N°7: laboratory CARSO, N°12: laboratory APAV, N°13 and N°14: laboratory Laboratoire de Rouen, N°17 and N°21: unknown), in other words the expertise produced was '*certified*'.

Second, two NGOs were concerned with the 'lichens biomonitoring' technique. This is a technique which allows the monitoring of air quality through the measuring out, notably of dioxins. Lichens are use as bio-indicators because they are one of the rare vegetal which accumulates dioxins. NGO (N°10) requested a regular environment pollution assessment. The public authority granted this request proposing the recourse to the lichens biomonitoring methods over a period of three consecutive years. These analyses concerned the site of an old incinerator plant which used to run. In another case, the NGO N°16 requested the setting up of the 'lichens method', at the date of the interview no answer was given yet by the public authority. On a side note, in the case of *Lasse*, the mixed syndicate recourses to the lichens biomonitoring, following the request of further controls from a group of "mushrooms gatherers" (this group is not among the NGOs studied in this research).

Third, even if the impact study is compulsory by law (Art. L 122-1, *Code de l'environnement*), two NGOs requested it to their respective public authority. An impact study consists of the assessment of the possible impacts of a facility on the environment. Then, the project must take into account this study to limit the environmental impact of the facility. The request made by NGO N°3 was not refused in principle, but the grouping of *communes* argued that it was too early in the decision-making process to carry out such a study, and finally the incinerator project has been given up. NGO N.20 declared that it requested an impact study which has been refused, even if such a study is compulsory by law. Moreover, in the same case, NGO N.19 declared that it asked the suspension of the project because of the absence of this compulsory impact study. However, the project went on and the decision-making process ended with the opening of the incineration plant.

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At last, in another case NGO N°17 asked for the assessment of the 'zero state', that is the assessment of the current pollution of the environment before the incineration plant started to run. This request was not granted.

Measuring of the emission of pollutants

Surprisingly, extra measurings of the emissions of pollutants were requested by few NGOs, namely six: N°4, 14, 16, 17, 20, and 22. These requests concerned the new incineration plants; once the opening of a new incineration plant was inevitable, these local NGOs wanted further monitoring of the emission of pollutants. To start with, three NGOs (N°4, 14, and 17) simply asked for the communication of the continuous measurement made by the operator/mixed-syndicate of a series of molecules, such as HCl, NOx, SO_2 (dioxins were not measured).[173] The request was refused in two cases and granted in one case. Concerning the trust in these measurements NGO N°17 did not say that it does not trust, but not that it does either: "*we don't trust the numbers 100%*" (interview N°17 *La Sauvegarde de l'Environnement*). As for the two other NGOs, NGO N°4 answered that the mixed-syndicate considered that there was no legal obligation to communicate the results of such analysis, and NGO N°14 complained about the lack of transp*AREN*cy of the mixed-syndicate.

Two NGOs (N°20 and N°22) requested a continuous monitoring of the emission of dioxins. The mixed-syndicate granted the request through the setting of 'cones Owens'. The 'cones Owens' are recipients distributed within a range of a few kilometres around the incineration plant. They gather the dusts falling out from the incinerator chimneys. Periodically, the dioxins present in the dust are measured. NGO N°22 did not make any comment about the trustworthiness of these analyses, while NGO N°20 complained about the fact that it did not participate to the choice of the sites where to install the recipients, and argued that "*[he is] not sure that the choices actually made were judicious*" (interview N.°20 *Un autre regard pour Maincy*). In other words, this NGO underlined the lack of "deciding together"(Callon M., Lascoumes P. Barthe Y., 2001). Furthermore, this same NGO argued that it would have preferred that the choice of the laboratory was done by *AFSSA, INVS*, or by

[173] Such continuous measurements are compulsory as from 28 December 2005 for all existing plants, and as from 28 December 2002 for all new plants (European Parliament And The Council Of Ministers, 28.12.2000, EC/2000/76, art. 20). Some mixed syndicates anticipated this obligation. However, if some mixed syndicate such as SMITOM (Vaux-le-Pénil) spontaneously communicated the results without prior requests from the local NGOs, some others (Angers, Calce, Guichainville) did not.

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the *Préfet* and not by the mixed-syndicate, in order to ensure the independency of the laboratory.

At last, NGO N°16 made the request for a continuous measurement of the emission of dioxins at the mouth of the chimney, but it was not granted by the grouping of *communes* which invoked a "technical impossibility". It should be noted that two mixed-syndicates (SIVERT, *Lasse*; SMITOM, *Vaux-le-Pénil*) have set up systems of semi-continuous measurement of the dioxins emission (Coper-diox™ type).[174] SIVERT set up such a system following the requests of some local farmers for further pollutants emission monitoring.

Trust in the results of the measurings of the emissions of pollutants

In the eight cases in which the requests were granted (N°7, 10, 12, 13, 14, 16, 17, 21), the declarations of the NGOs concerning the trust in the results of these analyses were not always clear. For two NGOs (N°17 and N°21) it is not possible to draw any conclusion since they did not mention the name of the laboratory, and did not make any comment about their trust in the analysis.

For two other NGOs (N°7 and N°10), the answers were ambiguous. While it declared that there is a "*relative trust, and a non-questioning of the results and conclusion drawn by INERIS*" (interview N°7, *CRITOM*), *CRITOM* also argued that the analysis were carried out too late after the shutting down of the old incinerator, and thus that "*after two years, they [the mixed-syndicate] were sure that they would have found nothing*". NGO *Comité du quartier des Neiges* simply answered that they accepted the proposal of the public authority which selected and paid for the lichens biomonitoring.

Three NGOs (*Alerte aux Déchets, la Hune and Guichainville Environnement*) trusted the results because the selected laboratories (respectively APAV, a "laboratory from Rouen", and Carso and Air Normandie) were accredited. NGO *La Hune* put it in a strong way: "*until proof to the contrary, one can not allow himself to contest accredited laboratories*" (interview N°14, *La Hune*).

At last, two NGOs (*Coordination Environementale des Pyrénées Orientales* and *La Hune*), which requested further assessments, trusted the results because they participated to the choice of the laboratory and of the sites where to take the samples. As Callon, Lascoumes,

[174] See *"Measurement Of The Emissions Of Pollutant"* in the section I of this chapter for further details.

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and Barthes put it, in this case the trust stems from the "deciding together" (Callon M., Lascoumes P. Barthe Y., 2001).

It is difficult to draw some strong conclusions concerning the trust in these expertises. However it seems that the NGOs rather trust the results. At least, no NGO declared that it distrusts the results of the analyses that they requested to the grouping of *communes*, and four out of the eight NGOs strongly stated they trust the results, putting forward the fact that the laboratories were accredited, and/or the fact that they participated to the organisation of the analyses. The fact that the laboratory is private or public seems to be totally unimportant: no NGO talked about this aspect.

Summary-Conclusion

The request made by the local NGOs to the public authority for the carrying out of scientific expertise is a very spread phenomenon among the NGOs: 14 out of 22 NGOs made such requests. And in all the decision-making processes which ended by the opening of a new incineration plant, at least one local NGO requested to the public authority to carry out specific scientific expertises. It is likely that the NGOs which did not request scientific expertise adopted a '*division of labour*' strategy among them: the local NGOs of a given case worked closely together, so they knew that another one asked for expertise to the public authority.

All the requests concerned *'local'* scientific expertise; the local NGOs wanted studies concerning their incineration plant project. No NGO asked for '*general'* expertises; even concerning the epidemiological studies, the NGOs wanted above all that the research take into consideration the residents who are around their incineration plant site. The NGOs wanted some contextualised scientific studies; they wanted scientific expertise in their backyard. These requests for *'local'* expertise show that the engagement of the local NGOs against waste incineration generally speaking is in fact a mobilisation against their local incineration plant project.

The requests concerned mostly the impact of dioxins on health and on the environment. The other requests were about other molecules emitted by the incineration plants. This is not surprising since, as we have seen in chapter 3, the opposition to the incineration plant projects of the NGOs is due to worries about the dioxins. Around 38% of the requests concerned the impact on health (11 requests: 6 epidemiological studies, 4 exposure studies, 1 sanitary risk evaluation), another 38 % concerned the impact on the environment (11 environmental Studies), and the 24 % remaining concerned the measurement of the emissions of pollutants.

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While most of the requested environmental studies were granted, almost all the requests for studies concerning health effects were refused, and half of the extra-measurements of the emissions of pollutants were granted. When the requests were granted, the expertises were carried out by officially accredited laboratories, that is, they are '*certified*' experts. To justify their refusal concerning the studies about the health effects, the public authorities invoked some technical arguments, such as the multiplicity of sources of dioxins, or the absence of cancer register. Indeed causal research on the impact of waste incineration on health, such as epidemiological studies, is very costly and requires very high technical competences. It is likely that local authorities cannot afford it or are not in a position to manage it. On the other hand, exposure studies, such as the measuring of dioxins in blood, are neither complicated nor costly to carry out (for the budget of a grouping of *communes*). But the execution of studies whose results could be questioned would only lead to increase in the public anxiety, which the authorities want to avoid. Therefore it is not surprising that they refused these requests. It would have been good to discuss the reasons for acceptance/refusal by the public authorities in greater detail. But in this research I have gathered only the views of the NGOs. In further research, it would be good to ask the authorities themselves about the reasons for not granting this kind of request.

The nature and the number of the requests made to the public authority confirms that the local NGOs counted on scientific expertise to answer their worries about the impact of household waste incineration on health, and on the environment.

As in the case of *Lasse* (only case in which top-down participation was organised before the *'realisation'* stage), it is likely that the granting of the requests for further monitoring diminishes the degree of controversy.

I have been surprised by the fact that the interviewed NGOs rather trust the results of the analyses made or ordered by their grouping of *communes*. Concerning the environmental studies, the NGOs seem to be little bothered by the fact that the laboratories were chosen and paid by the public authority, and they do not question the reliability of the analyses. Only a very few NGOs stated that their participation to the selection of the laboratory or to the selection of the sites where taking the samples is an important element to trust the results. It seems that the key element of the trust is the fact that the laboratory has an official accreditation. In other words, certification is a key element for the trustworthiness of a source of scientific expertise. Another element which favours the trust in the result is the "deciding together" (Callon M., Lascoumes P. Barthe Y., 2001), that is the participation of the NGOs to the elaboration of the measuring, such as the choice of the site where to take the samples.

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At last, the requests for the carrying out of these studies have raised the problem of the budget of the Local Commission for Information and Monitoring. According to the law, the setting up of a budget is possible but not compulsory. In absence of a budget, the realisation of sanitary studies is cautioned to the acceptance of the mixed syndicate or of the operator to pay. And a priori, extra monitorings of the emissions of pollutants are not in their interest.

V.Seeking Scientific Expertise and Type of NGO

As I have shown in chapter 3, two types of NGOs can be distinguished: '*ad hoc*' and '*existing*'. 11 '*ad hoc*' and 11 '*existing'* NGOs engaged in the 10 decision-making processes. Relating the types of the NGOs to the research of scientific expertise of the 22 NGOs, it emerges that the '*ad hoc*' NGOs directly mobilised more scientific knowledge than the '*existing*' ones (see tables 16 and 17 below). In this analysis I only consider the scientific expertise directly mobilised by the local NGOs and not the expertise requested to the public authorities. Indeed, the local NGOs typically requested extra-monitoring of emissions and their environmental and health effects (rather than analyses of the causal relationships). This type of request often has a subtext: we do not trust the system as it is. A request for ever more data of this kind is unlikely to make them more supportive of incinerators. Furthermore, most of the results of these monitoring activities had yet to be obtained: it could not assess their effects at the time of the study.

The fact that the '*ad hoc*' NGOs sought more scientific expertise than the 'existing' NGOs is supported by four elements. To start with, as table 16 and 17 below shows, the most speaking element is that only three out of eleven '*existing'* NGOs resorted to '*general scientific knowledge*', while almost all the '*ad hoc*' NGOs (nine out of eleven) did. Secondly, the four NGOs which paid for local scientific expertise are '*ad hoc*' NGOs; none of the '*existing'* NGOs directly mobilised '*local'* expertise. Thirdly, most of the '*existing*' NGOs, that is nine out of 11, did not directly mobilise scientific expertise at all, but only made some requests to their public authority, whereas only two out of the eleven '*ad hoc*' NGOs did so. Finally, these two '*ad hoc*' NGOs invoked the cost of carrying out expertise to explain their non-direct mobilisation of scientific expertise, whereas among the nine '*existing*' NGOs, five invoked the '*division of labour*', and only four the cost (see sub-section I.5 below). It should be remembered that while the '*division of labour*' is really a choice made by the NGOs, the absence of mobilisation of expertise due to cost is not a choice at all. Through the '*division of labour*' the '*existing'* NGOS relied on the '*ad hoc*' NGOs for the mobilisation of scientific

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expertise. Moreover, the '*ad hoc*' were more active than the '*existing'* NGOs, they organised more initiatives against the incinerator project, than the '*existing'* NGOs.

In brief, the main difference comes from the fact that '*ad hoc*' NGOs are more than twice as likely to seek 'general' expertise, i.e. educate themselves by reading technical and scientific literature. This could depend on the fact that they have less background knowledge to start with, or for some other reasons. Both types of NGOs emphasize the importance of local expertise (with the existing ones seeking such expertise slightly more often than the local ones). Here the difference is that the '*ad hoc*' ones sponsor some of these expertises directly, while existing ones only make requests to the authorities.

It seems that there is a negative correlation between the propensity to seek (certified) expertise and the opposition to waste incineration plants. The more the NGOs sought (certified) scientific expertise the more they opposed the incinerator project or vice versa, the more opposed the NGOs are to incinerators the stronger their effort to mobilize scientific arguments as well as to engage in other actions strengthening their position. In fact, in this research, the '*ad hoc*' NGOs were created to stand against a local incineration plant. I remind that the main motivation for the engagement of the local NGOs is that they were worried about the impact of waste incineration on health. Then, they sought scientific expertise in order to get an insight into the dioxin-health issue and the existing scientific expertise, which tends to show that incineration is possibly dangerous for health, reinforced the opposition of the local NGOs to the incineration plant projects. In order to better support this claim, it would be necessary to actually demonstrate that the activity of the *ad hoc* NGOs is more important that the one of the existing NGOs, that is, that '*ad hoc*' NGOs actually sponsored more bottom-up initiatives than '*existing*' NGOs.

Table 17. Direct mobilisation of scientific knowledge and types of NGOs: frequency table

	No seeking of scientific expertise	**Direct mobilisation of general scientific knowledge**	**Direct mobilisation of *'local'* scientific knowledge**	**Request *'local'* scientific expertise to the public authority**
'*Ad hoc*' NGO	0	9	4	7
'*Existing*' NGO	3	3	0	7

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Table 18. Direct mobilisation of scientific knowledge and types of NGOs

NGOs	No seeking of scientific expertise	Direct mobilisation of general scientific knowledge	Direct mobilisation of *'local'* scientific knowledge	Request *'local'* scientific expertise to the public authority	Type of NGO
1. *VPIG*		X			Ad-Hoc
2. *Autun Morvan Ecologie*		X			Exist.
3. *Collectif Inciner'àtort*		X			Ad-Hoc
4. *AREN*		X	X	X	Ad-Hoc
5. *Collectif Halt Incin*'		X			Ad-Hoc
6. *Thiviers la Vie*		X			Ad-Hoc
7. *CRITOM*		X	X	X	Ad-Hoc
8. *Ecologie Pour Le Havre*				X	Exist.
9. *SOS Estuaire*				X	Exist.
10. *Comité du quartier des Neiges*				X	Ad-Hoc
11. *Compiègne Ecologie*	X				Exist.
12. *Alerte aux Déchets*		X	X	X	Ad-Hoc
13. *Coordination Environementale des Pyrénées Orientales*				X	Ad-Hoc
14. *La Hune*		X		X	Exist.
15. *Charles Flahaut*	X				Exist.
16. *Guichainville Environnement*				X	Exist.
17. *La Sauvegarde de l'Environnement*				X	Exist.
18. *ASMSN*	X				Exist.
19. *Association des Médecins de Maincy*		X		X	Ad-Hoc
20. *Un autre regard pour Maincy*				X	Exist.
21. *AVIE*		X	X	X	Ad-Hoc
22. *AIPPNE*		X		X	Exist.

* the '*ad hoc*' NGOs are highlighted in grey while the '*existing*' are in white

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VI. Reasons for not Mobilising Scientific Expertise

As I have stated in the theoretical framework, The NGOs which did not mobilise scientific expertise can be placed into two categories: those which did not seek expertise and those which failed to obtain the sought expertise. Only three NGOs did not seek scientific expertise while eleven others failed to obtain all or part of the sought expertise.

Reasons for Not Seeking Scientific Expertise

As table 18 below shows, only three NGOs (N°11, 15, and 18) did not seek scientific expertise. The reasons they invoked only partially matches the typology developed by Mike Michael, which is made of three types: '*division of labour*', '*deliberate choice*', and '*mental constitution*' (See chapter 7, section III for further details about his typology). In fact I have had to partially modify the definition of these types. Two NGOs adopted a '*division of labour*' and one a '*deliberate choice*' view.

NGO N° 15 argued for a '*division of labour*' between them and the health experts. To the question about the production or use of scientific expertise on the impact of dioxins on health, this NGO answered: "*Everyone has its own domain. Health is the role of the people who deal with it.*" (interview N° 15, *Charles Flahaut*). Also *ASMSN* (NGO N°18) adopted a '*division of labour*' view. However the repartition of competencies is not envisaged not between the experts and NGOs, as in the original definition sets up by Mike Michael, but among the local engaged NGOs themselves. In other words the position of these NGOs is that they did not need to mobilise scientific knowledge since other NGOs did it; "*you should see with the other NGOs, our NGO is more interested in the clinker management*" (Interview N°18, *ASMSN*)

Only NGO N°11 held a '*deliberate choice*' position. It did not claim, however, that it is not interested by scientific expertise but that "*the information received through CNIID and NGO Alerte aux Déchets [were] enough*" (interview N°11, *Compiègne Ecologie*)

No NGO invoked a failing '*mental constitution*' to justify the fact that they did not resort to scientific expertise. Only one NGO declared that it remained superficial with regard to scientific knowledge because of a lack of internal competences to deal with them: "*We use above all [scientific] information. We did not enter in depth. One must be connoiseur, technician.*" (Interview N°1, *VPIG*) It is not surprising that no NGO invoked the '*mental constitution*' since this view is linked rather to individuals; it is more difficult to apply this concept to a legal entity or group of persons (Mike Michael built up his typology on the basis of interviews with individuals, while I study NGOs, that is, groups of people).

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Table 19. Reasons for not mobilising scientific expertise

NGOs	No Seeking Scientific Expertise	Justification for non or partial seeking of expertise	Declaration of a problem of cost of expertise	Request of *'local'* scientific expertise to the public authorities	Total or partial rejection of the requests
1. *VPIG*					
2. *Autun Morvan Ecologie*					
3. *Collectif Inciner'àtort*				X	X
4. *AREN*			X	X	X
5. *Collectif Halt Incin*'					
6. *Thiviers la Vie*					
7. *CRITOM*				X	X
8. *Ecologie Pour Le Havre*			X	X	X
9. *SOS Estuaire*		Division of labour		X	
10. *Comité du quartier des Neiges*			X	X	X
11. *Compiègne Ecologie*	X	Deliberate choice			
12. *Alerte aux Déchets*				X	X
13. *Coordination Environementale des Pyrénées Orientales*			X	X	
14. *La Hune*			X	X	X
15. *Charles Flahaut*	X	Division of labour			
16. *Guichainville Environnement*			X	X	X
17. *La Sauvegarde de l'Environnement*			X	X	X
18. *ASMSN*	X	Division of labour			
19. *Association des Médecins de Maincy*		Division of labour	X	X	X
20. *Un autre regard pour Maincy*		Division of labour	X	X	X
21. *AVIE*			X	X	X
22. *AIPPNE*			X	X	X
Total	3	-	11	15	13

'*Ad hoc*' NGOs are highlighted in grey while '*existing*' are in white

Three NGOs which did mobilised expertise or which made some requests to their public authority for expertise invoked a division of labour between the NGOs to justify the fact that they did not seek certain types of expertises (NGOs N°9, 19 and 20). Concerning the carrying out of blood analysis of the residents, NGO N°20 mentioned that the '*division of labour*' among NGOs is a strategy to overcome material limits due to the nature of the NGO: "*This is [NGO 21] which has dealt with this issue. We are a small local NGO. We have neither the*

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time nor the means to do everything. There is a distribution of the tasks among the NGOs. The aim of our NGO was to say: 'beware! It is not so simple'. We did not need to be as precise as [NGO 22]" (interview N°20, *Un autre regard pour Maincy*). Let's note that the '*division of labour*' and the cost of expertise are closely related factors. Still about the same blood analyses, NGO *Association des Médecins de Maincy* declared that "*expertises have already been realised by NGO AVIE […]*". To the questions about the mobilisation of scientific expertise, NGO *SOS Estuaire* answered: *"for these matters [i.e. scientific expertise], you should ask to the NGO [N°8]"* (interview N°9, *SOS Estuaire*).

I could have developed a fifth type of the reasons for not seeking scientific expertise, namely '*lack of time*'. However, I have finally not included this type because it was not well grounded. Only one NGO (*VPIG*) invoked a lack of time: "*[the NGO has] not gone deeper into scientific expertise because of a lack of time*" (interview N°1, *VPIG*). Moreover, this NGO mobilised some scientific expertise.

Relating the reasons to the type of NGO (see table 19 below), it emerges that the division of knowledge and sufficient knowledge ('*deliberate choice*'/'*division of labour*') are indicated almost solely by the existing NGOs, while the problem of costs is mentioned roughly equally often by both types of NGOs. It could be that existing NGOs are more sophisticated in their strategies of mobilising knowledge, or merely that they rely on others (other NGOs and public authorities) to get scientific expertise.

Table 20. Type of NGO and reasons for not mobilising scientific expertise: frequency table

	Division of knowledge	**Problem of cost**
'*Ad hoc*'	1	5
'*Existing*'	5	6

Reasons for failing to obtain the sought expertise

No NGO invoked the impossibility of mobilising general scientific expertise. From the interviews, it seems that they obtained all the general expertises they sought. On the contrary, as I have shown in the previous section, many NGOs (11) could not afford the cost of *'local'* expertise and consequently requested to their public authority for their carrying out. Consequently, the NGOs which failed to obtain the sought expertise are those which the requests were not granted by the public authority. In other words, the reasons for the failure to

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obtain the sought-after expertise are thus the conjunction of the cost of the expertises and the refusal of the public authorities.

Only one NGO (N°16) which sought expertise finally did not succeed in getting any: it did not mobilise expertise and all its requests were refused. However, as table 19 above shows, all the NGOs which requested some expertise faced some refusals. In the facts, about half of the requests made to the public authorities were not granted (see table 15 in sub-section I.3 above). Most of the refusals were partial, that is, the public authorities granted a part of the requests and rejected the other one, respectively. The rate of granting/refusal mainly depends on the type of expertise requested. As I have exposed in sub-section I.3 above, the requests covered the entire range of types of expertise that can be made to evaluate the impact of incineration on health (epidemiological studies, exposure studies, sanitary risk evaluation), or the environment (environmental studies, measurement of the emission of pollutants).

To start with, the six requests for epidemiological studies were rejected (see table 15 in section I.3 above). Three NGOs declared that the public authorities justified their refusals with technical arguments: in two cases it was impossible to realise epidemiological studies because of the lack of cancers registers (N°12 and 19), and in two other cases the multiple sources of dioxins prevented from evaluating the impact of the dioxins produced only by the incinerator (N°8 and 12). The three other NGOs (N.20, 21, 22) did not talk about the reasons invoked for the refusal. However, since these NGOs are all three linked to the same decision-making process as NGO 19, the reason is likely the same: the absence of cancer register. Moreover, NGO 22 also requested the setting up of a cancer register for future studies, but this request was rejected too.

None of the three requests for blood tests (NGOs N°7, 10, 20) and for maternal milk test (NGO 16) was granted by the public authorities either. The reasons of these refusals have not been exposed by the NGOs or by the public authorities. Since the cost is not that high for the budget of the public authorities, it is likely that the local public authorities did not want to take the risk to uncover that some residents were contaminated by dioxins. Consequently, it is also likely that the material impossibility to carry out epidemiological studies was not really a problem for the public authorities…

The refusals concerning environmental studies and the measurement of the emission of pollutants do not depend on the type of expertise requested but rather on the public authority/decision-making process. These requests were granted by certain public authorities and not by others. In fact, only seven out of the eighteen requests concerning environmental studies and the emission of pollutants were rejected, and six of these rejections concerned two

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decision-making processes (one highly and one slightly controversial). Moreover, these two grouping of communes rejected all the requests made by the NGOs. In the light of the data I have, it is difficult to interpret these refusals from these two public authorities. They occurred in one highly and one slightly controversial decision-making processes.

Let us note here, however, that in the highly controversial decision-making process quoted above, the grouping of communes finally abandoned the incineration plant project (most of the requests concerned the old incineration plant which was still running at the time of the decision-making process), whereas in the highly and moderately decision-making processes which ended by the opening of the incineration plant, the groupings of *communes* granted most of the requests. It is thus likely that the public authorities granted the requests in order to make the new incineration plant more acceptable.

VII. Overcoming the NIMBY Label

As stated in the previous chapter, in order to gain moral credibility, an obstacle the local NGOs have to overcome is the NIMBY label. The analysis of the overcoming of the NIMBY label is based on the interviews with the twenty two engaged NGOs. This analysis is not an analysis of the discourse that the NGOs made to convince the wider public or the decision-makers, which is the subject of the section III of this chapter. But while the overcoming of the NIMBY label is one of the arguments I talked about in the development of the theoretical framework concerning the discourses of the NGOs, the nimby issue spontaneously popped up in many of the interviews with the NGOs. Consequently, I have considered that it was an issue of importance that I should deal with. To the questions number 2 “for which reasons has your NGO been created?” and number 6 “what is your positioning with regard to the incineration plant?”, 14 out of the 22 interviewed NGOs spontaneously talked about the NIMBY issue, in a more or less explicit way, even quoting sometimes the concept of NIMBY itself. Three NGOs were not initially opposed to the incineration plant project, so the NIMBY label was not an issue for them, and it has not been possible to draw some conclusion after the declaration of three NGOs. Only one NGO did not try to overcome the NIMBY label and stated that the aim of the NGO was to “*alert against the [local] incineration plant project*” (interview N°7, *CRITOM*). The positioning of the NGOs with regard to the NIMBY label is summarised in the tables 20 and 21 below. Among the three strategies to overcome the NIMBY label, the most used is the Not In Anybody Backyard (NIABY). Indeed, most of the NGOs (i.e. 8) which dealt with the NIMBY issue attempted to generalize their position concerning the incineration plant project: they explained that they are against the incineration

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of waste generally speaking not only against their local incineration plant project. For example, they declared that "*they are opposed to the principle of incineration*" (interview N°2, *Autun Morvan Ecologie*), that "*incineration is not a good method for the waste treatment*" (interview N°13, *Coordination Environementale des Pyrénées Orientales*), or that they are "*against thermical waste treatment in the département and opposed to the sending of the wastes elsewhere for incineration*" (interview N°5, *Collectif Halt Incin'*). Five NGOs resorted to the LISU (Local Inappropriate Site Use) argument. One NGO declared that incineration is not appropriate to a rural *department* (interview N°6, *Thiviers la Vie*), while two other where opposed to the setting up of a new incineration plant on the same site of the old one because of the existing pollution (interviews N°19 *Association des Médecins de Maincy*, et N°20 *Un autre regard pour Maincy*), at last one NGO argued that "*there is no evidence that the site selected is the less bad in the circonscription*" (interview N°20, *Un autre regard pour Maincy*). One NGO made a reference to the LISU argument but in a positive way, since it is "*not against an incineration plant if it is situated on an appropriate site*" (interview N°10, *Comité du quartier des Neiges*). However, this NGO had an interest in the setting up of a new incineration plant. Indeed, this NGO is composed of the residents next to an old incineration plant which has been closed following the setting up of a new one in the middle of a big industrial zone, and far away from their housing.

No NGO resorted to the BANANA (Build Absolutely Nothing Anywhere Near Anyone) strategy. Obviously, this radical position has little chance to increase the moral credibility of the local NGOs in the eyes of the wider public: it is necessary to build up new facilities in order to treat household wastes.

Three NGOs did not contest the choice of the site but the choice of the waste treatment technology. In other words, they argued (in a more or less explicit way) that they did not oppose the setting up of a waste treatment facility on the selected site, but they did not want the incineration technology. They wanted an alternative waste treatment technique. In other words, beyond the NIABY or LISU arguments, the local NGOs set up a fourth type of strategy, the proposition of alternatives, I label this argument Local Alternative Land Use (LALU). As a matter of fact, from the question N°14 "have you mobilised technical knowledge concerning incineration or the alternatives for the waste treatment?", it follows that most of the NGOs searched for some information about the alternative waste treatment techniques and that they supported some of these. As table 20 below shows, fourteen NGOs in nine out of the 10 studied cases searched for information about alternative techniques: thermolysis, pyrolisis, methanisation, and mechanical biological sorting. Six NGOs have not

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searched for information, however only in one case none of the NGOs dealt with the alternative techniques. It should be highlighted that at the local level the NGOs worked together in a large extent and that they were a distribution of the tasks between them. To conclude, the LALU strategy can be qualified as "positive" since it offers alternatives to the incineration plant project, whereas the NIABY, LISU, or BANANA strategy are "negative" since they are limited to the opposition to the initial project set up by the decision-makers.

From table 21 below, it emerges that there is no correlation between the type of the NGO and the strategy to overcome the NIMBY label.

To finish, this section on the NIMBY issue clearly indicates that technological alternatives were an issue for most of the NGOs. Consequently, it would be interesting to analyse the setting up of incineration plant, not only in the light of the PUS literature, but to also of the public technological choice perspective litterature.

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Table 21. Frequency of use of the strategies to overcome the NIMBY label and type of NGO

Strategy / Type of NGO	NIMBY	NIABY	LALU	LISU	BANANA
'Ad hoc'	1	5	3	3	0
'Existing'	0	3	2	2	0
Total	1	8	5	5	0

Table 22: strategies of the 22 NGOs to overcome the NIMBY label

NGOs (designated by a number)	Positioning with regard to the incineration plant	Strategy to overcome the NIMBY label	Research of Alternative Technologies
1. *VPIG*	Against incineration Opposition also after the given up	NIABY	Methanisation Visit of sites
2. *Autun Morvan Ecologie*	-	-	A member made afile about the alternatives
3. *Collectif Inciner'àtort*	Against principle of incineration. No opposition to the choice of the site but to the technology.	NIABY LALU	Visits of sites. Mechanical biological sorting
4. *AREN*	Against incineration plant also in the other site	NIABY	?
5. *Collectif Halt Incin'*	Against waste thernical treatment in the department and not sent wastes elsewhere for incineration	NIABY	Contact with local decision-makers from other places
6. *Thiviers la Vie*	Against incineration in a rural département	LISU	Visit of sites Mechanical biological sorting
7. *CRITOM*	Warn about the incineration plant project. Increasing selective sorting	NIMBY LALU	Bio-masse, methanisation and others
8. *Ecologie Pour Le Havre*	Against incineration. In favour of methanisation	NIABY LALU	Methanisation
9. *SOS Estuaire*	Against incineration generally speaking	NIABY	Methanisation See *EPLH*
10. *Comité du quartier des Neiges*	Not against an incineration plant if it is situated on an appropriate site	LISU	Asked for increasing of the selective sorting
11. *Compiègne Ecologie*	Opposition to the incineration plant wherever they are	NIABY	No
12. *Alerte aux Déchets*	Have information about the project. Study alternative to incineration for the waste treatment	LALU	Yes visit of sites. Internet
13. *Coordination Environementale des Pyrénées Orientales*	Incineration is not a good method for the waste treatment	NIABY	No, this is not the role of the NGOs
14. *La Hune*	Incineration as a transitory solution	Initially, incineration was not Problematic	No, because the NGO has little means
15. *Charles Flahaut*	Necessity to treat the wastes. Incineration was the less bad solution	No Problematic	No

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NGOs (designated by a number)	Positioning with regard to the incineration plant	Strategy to overcome the NIMBY label	Research of Alternative Technologies
16.*Guichainville Environnement*	Opposition to the incineration plant because there are alternative solutions less dangerous for the heatlth	LALU	Thermolyisis, mechanical biological sorting, individual composting
17.*La Sauvegarde de l'Environnement*	Opposition to incineration because of the health effects	-	Pyrolisis, mechanical biological sorting
18.*ASMSN*	Initially, incineration was not a matter. This was considered as a progress by comparison to the landfills	Initially, incineration was not Problematic	Vaguely
19.*Association des Médecins de Maincy*	Wondering about the opportunity to set up a new incineration plant on the same site because of the existing pollution	LISU	No
20.*Un autre regard pour Maincy*	Against the siting of the incineration plant which is at the geographical center and not at the barycentre of the population. No demonstration the site was the less bad of the circonscription	LISU	No
21.*AVIE*	The aim of the NGO is to obtain compensations for the victims of the old incineration plant	-	No because the NGO has been created lately
22.*AIPPNE*	Opposition to the incineration plant because of the pollution due to the old incineration plant	LISU	Through CNIID. Maximising selective sorting is the best solution
'Ad hoc' NGOs are highlighted in grey, 'existing' are in white			

VIII. Conclusion

The analysis of the sources of scientific expertise of the NGOs supports the idea that local NGOs are likely to make constructive contributions to local technical-scientific decision-making processes. The sponsoring of top-down participation initiatives from the outset of the decision-making processes would have very probably improved the quality of the expertise delivered to the local public authorities. Taking again the concept developed by Nowotny, Scott, and Gibbons (2001), this means that the local NGOs are likely to contribute to the '*social robustness*' of scientific expertise thanks to the plurality they bring.[175]

To begin with, local NGOs are likely to bring alternative worthwhile scientific expertise in local decision-making processes. Even though they are unable to produce their own expertise because of the lack of internal competencie, they are capable to seek and mobilise '*local*' and '*general*' '*external certified scientific expertises*'. Almost all the NGOs sought, and most of them brought some, scientific expertises. Furthermore, almost no NGO made the '*deliberately choice*' of not seeking scientific expertise. Some NGOs failed to mobilise the sought ('*local'*)

[175] See chapter 1

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expertise, but it was not a deliberate choice; the reasons for these failures are the conjunction of economic impossibilities of the NGOs and of refusals of the public authorities to order and pay for the expertises. In order to make possibe an efficient participation of the public to the decision-making process, it would be necessary to provide the participation mechanisms, such as the Local Commission for Information and Monitoring, with a budget dedicated to the carrying out of extra scientific expertises. Many Science Studies scholars argue for the incorporation of 'non-standard' knowledge in order to improve the governance of risk (Wynne B., 1992; Fischer F., 1999; Weale A., 2001; Callon M., Lascoumes P. Barthe Y., 2001; Jasanoff S., 2003; Grundmann R. and Stehr N., 2003; Dietrich H., Schibeci R., 2003/10/1).[176] I do not question the probable valuable contribution of 'non-standard' knowledge. But in this study, I have focused on 'standard knowledge', and the analysis shows that the public (here the local NGOs) are likely to contribute to the decision-making bringing valid alternative 'standard knowledge'. The fact that the expertise brought by the local NGOs was valid is supported by the fact that, to a very large extent, the scientific expertises were '*certified*': the local NGOs mainly sought '*general*' expertises produced by recognized public institutions or researchers, and '*local*' expertises produced by officially accredited laboratories. They resorted to a very minor extent to '*experienced-based*' expertise.

Secondly, generally speaking, in technical-scientific decision-making processes, debates are likely to be easier when the participants agree on what counts as scientific expertise, and what does not. In the cases studied here, it seems that the '*certification*' of scientific expertise is likely to prevent the NGOs and public authority from making '*boundary works*', that is, from disputing what counts as scientific expertise and what does not (Gieryn T.F., 1995; Gieryn T. F., 1999c)[177]. Indeed, from the interviews of the local NGOs, it appears that the local NGOs sought mainly for '*certified*' scientific expertise very likely in order not to be contested by the public authority. In fact, the public authorities did not question the validity of the results of the '*local*' expertises ordered by some local NGOs to officially accredited laboratories (in future researches, it would be interesting to verify whether the public authority recognise the scientific character of the general '*certified*' expertises mobilised by the local NGOs). Moreover, the local NGOs trusted the expertises ordered by the public authorities; the main reason for this trustworthiness is that the laboratories were officially accredited. Therefore, the recourse to '*certified*' expertise, and especially to officially

[176] See chapter 1
[177] See chapter 1

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accredited laboratories, is likely to avoid or at lleast to limit attempts of making 'boundary works' in order to discredit the opponents. This does not mean, however, that the involved parties would necessarily agree on the content of the expertises. They may mobilise contrasting expertises, and they may confront on the interpretation of the results. For example, the interpretation of the epidemiological study carried by *INVS* (2003) is likely to depend on the point of view of the reader. In substance, in the conclusion of this study, it is argued that the old generation incineration plants were actually dangerous but that these results do not allow the evaluation of the dangerousness of the new generation incineration plants.

As pointed out by some Science Studies scholars, scientific expertises inevitably incorporate popular conceptions and personal values (Jasanoff, S, 1990; Nowotny H., 2003; Jasanoff S. and Lynch M., 1998; Funtowicz S. and Ravetz J., 1992), and very few researchers are not affected by their personal interest and financial dependence when acting as experts (Jasanoff, 1990).[178] However, this research suggests that these drawbacks listed by Science Studies scholars were not a problem for the local NGOs. Indeed, this research shows that NGOs trust '*certified*' expertises, especially the local ones carried out by officially accredited laboratories, not minding who ordered them. This suggests that the matter of the local NGOs is not the sources of expertise of the local public authority (in a given domain), but the selection of the relevant domains. In other words, the main problem for the studied local NGOs was the framing of the issue under discussion. In fact, the local NGOs attempted to widen the framing of the waste incineration issue including sanitary and environmental concerns. Indeed, the sought '*general*' and '*local*' expertises and the expertises requested to the public authorities concerned mainly the impact of incineration on health and on the environnement. According to the NGOs, these two issues were almost not considered by the local decision-makers. This result supports the position hold by numerous scholars who claim that public involvement have the potential to widen expertise in order to answer the complexities of the social and the political world (Wynne B., 1992; Fischer F., 1999; Weale A., 2001; Callon M., Lascoumes P. Barthe Y., 2001; Nowotny H., Scott P. Gibbons M., 2001; Nowotny H., 2003; Jasanoff S., 2003; Grundmann R. and Stehr N., 2003; Dietrich H., Schibeci R., 2003/10/1).[179]

At last, the local NGOs strongly emphasized '*local'* expertise; they largely prefer it to the '*general'* ones. They wanted expertise made in their backyard. The expertises contextualised

[178] See chapter 1
[179] See chapter 1

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in their own cases seem to be more convincing to the local NGOs. But above all, '*local*' expertises are more likely to be politically effective, simply because the local population is probably more concerned by the local incineration plant project: in their daily life, they face or will face their local incineration plant and its possible effects on health, not the other incineration plants running in France. Moreover, the emphasis on the local monitoring of the plants is likely to (i) create a degree of control over the operations of the technology-in-use, and (ii) create the possibility of re-opening the debate in the future. For material reasons, it was not always possible to carry out the '*local*' expertises wanted by the local NGOs. it is often possible to carry out '*local*' environmental expertises whereas it is much more difficult to realise '*local*' epidemiological studies. Environmental studies are easy to realise: samples are taken and then sent to a (officially accredited) laboratory. As we have seen the local NGOs and the local public authorities may be in position to order and pay for such expertises. These '*local*' environmental expertises are likely to increase the knowledge of the actual state of the local environmental pollution, and thus to positively contribute to the decision-making; in other words it increases the quality of the overall expertise delivered to the local decision-makers.

On the contrary, the carrying out of '*local*' epidemiological studies is often impossible since they often require the selection of multiple incineration plants to monitor a series of parameters. Significant epidemiological studies are more likely to be produced at the national level, by the State agencies *INVS* or *AFSSA*. As we have seen, these agencies produced some national epidemiological studies, but which were produced rather late. The setting up of national participation mechanisms could be a solution to make these agencies more reactive in front of the needs for further expertises of local NGOs or local decision-makers. These mechanisms should involve, notably, the state agencies, the concerned national NGOs (with their net of local NGOs), and the associations of local public authorities such as *Association des Maires de France*. In these participation mechanisms, it should be given the possibility to the local public authorities and the local NGOs to directly request the carrying out of expertises to the State agencies.

Another aspect of the local dimension is the importance of the NIMBY issue for the local NGOs. As a matter of fact it spontaneously popped up in the interviews. The NGOs did not have a NIMBY attitude: they did not say "*build the incineration where you want but not next to our home*". On the contrary, the NGOs perceive the NIMBY label as an obstacle that they had to overcome. In fact, they resorted to various strategies to overcome the NIMBY label, they resorted mainly to the NIABY (Not In Anybody Backyard) and LISU (Local Unadapted

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Site Use) and to a minor extent to the LASU (Local Alternative Site Use) strategies. No NGOs resorted to the BANANA (Build Absolutely Nothing Anywhere Near Anyone) strategy. This is not surprising since 'BANANA' is a negative label which highlights an extreme and untenable position: the refusing of any change. It is likely that the aim of the NGOs was to gain '*moral credibility*' in the eyes of the wider public. The discourses of the NGOs may lack of sincerity, but this is not the important point. The main point is that the NGOs' attempts to avoid the NIMBY pitfall led them to the research of alternative technologies to incineration. This research confirms theories proposing fairly positive view of the NIMBY phenomenon. This research shows that citizens may have a good grasp of and reasonable concern for health and welfare, which are ignored by technical and administrative elites (Fiorino D., 1995; Matheny A. and Williams B., 1985; Kraft M. and Clary B., 1991; Hunter S. and Leyden K. M., 1995).[180]

From a theoretical point of view, the property space of the sources of scientific expertises developed in the theoretical framework (chapter 8) works quite well for the studied local NGOs. In the light of the empirical study, I have distinguished the '*general'* and '*local'* expertise: the '*general'* expertise consists of existing studies, while the '*local'* consists of original analyses, such as the measurement of dioxins in the soil, cow's milk, or eggs, which are made around the incineration plants the local NGOs are directly concerned with.

Concerning the reasons of the NGOs for not mobilising scientific expertise; the typology developed by Mike Mikael (1996) – '*mental constitution*', '*deliberate choice*', and '*division of labour*' – fits only very partially the present research. First, no NGO invoked the '*mental constitution*' to explain why they did not seek scientific expertise, which is not surprising since this reason is much more likely to be invoked by natural persons than by legal entities such as the local NGOs. Second, I have had to modify the type '*division of labour*' since the NGOs talked about a division of labour among the local NGOs and not between the NGOs and the experts as defined by Mike Mikael. Only the type '*deliberate choice*' fits well in this research.

As for the NIMBY issue, I have identified a strategy that I did not find in the literature: the 'Local Alternative Site Use' (LASU). In the 'Local Alternative Site Use', this is not the choice of the site which is questioned but the choice of the waste treatment technology. The

[180] See chapter 7

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NGOs argue that alternative waste treatment technology should be used. Of course, this strategy can be used only when there are alternatives. This argument may be intertwined with the LISU argument, that is, some NGOs claim that the site is not adapted for the proposed activity, and they propose another destination for the site.

To finish, from a theoretical perspective point of view, this analysis of the sources of scientific expertise of the local NGOs supports the position held by the '*critical*' PUS scholars, that is, that the public is able to reflect on the source of their knowledge, that they are able to assess the credibility of the source and to evaluate the quality of the knowledge they have acquired (Irwin A. and Wynne B., 1996; Irwin A. and Michael M., 2003).[181]

[181] See chapter 7

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Chapter 9
Scientific Expertise in the Discourses of the Local NGOs

As we have seen, sanitary risks are at the core of the concerns of residents, and the main reason for their engagement. Moreover, in the previous chapter, we have seen that the engaged NGOs searched for scientific expertise in order to have an insight into the dioxin-incineration-health effects issue and to monitor the pollution emitted by the incineration plants. This chapter intends to answer to the research question n°6: "Is scientific expertise a key argument in the discourses of the NGOs; what are the other types of arguments NGOs employ in their discourses to convince the wider public and the public authorities?" The aim of this chapter is to analyse the strategy of the NGOs to confront scientific expertise (mobilisation, challenge, demarcation, complementary) and to evaluate whether they try to gain '*cognitive'* or '*moral' credibility*'.

The first section introduces the methodology used, while section II deals with the discourse of the NGO *AREN,* and section III with the discourse of the NGO *Collectif Inciner'àtort*.

I. Methodology

I.1. Selecting the Cases

For reasons of time, I could not analyse the discourses of the 22 NGOs which engaged in the eleven decision-making processes. Consequently, this analysis is based on the discourses of two *ad hoc* NGOs, *AREN* and *Collectif Inciner'àtort*, which strongly engaged in the decision-making process of *Angers*.

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These two NGOs have been selected two reasons. First, for these two NGOs the question of the health impact of the incinerator was acute. Consequently, as I have stated in the previous chapter, for these two NGOs, scientific expertises have been an important source of information to get an insight into the incineration-dioxins-health effects issue. In other words, they knew a series of '*certified'* expertises. It would have not been possible to make any analysis of the use of scientific expertise in the discourses of NGOs which did not seek and find many scientific expertises. Second, these two NGOs are two extreme cases. Indeed, the decision-making process of *Angers* has been selected because it was the most controversial decision-making process. As we have seen in chapter 4 and 6, a high degree of controversy means that the NGOs strongly engaged in the decision-making process. In fact, as I have shown in chapter 6, *AREN* and *Collectif Incine'àtort* are the two NGOs which sponsored the highest numerous of bottom-up communication initiatives, among which many newsletters and press releases. Thus, there are some materials to be studied; it would have been difficult to make an analysis of the discourses of NGOs which published very few documents.

Therefore, these two NGOs are more likely than the others to have used a great deal of scientific expertise, and to have built the most complex discourses in order to support their opposition to the incineration plant project. The analysis being based on two cases, the aim of this section is more to illustrate novel concepts rather than to build a complete theory. Besides, if the analysis shows that these two extreme NGOs did not use that much scientific expertise in their discourses, it is likely that the other NGOs did not either. On the contrary, if scientific expertise was central in the discourses, it would be interesting to analyse other NGOs in order to evaluate in details the variations of the use of scientific expertise in their discourses and their reasoning.

I.2. Data Collection and Analysis Method

The analysis relies on the documents published by the two NGOs. The documents were aimed at the wider public or to the public authority. The data analysis method is inspired by the grounded theory methodology[182] and the analysis has been conducted with the help of the software Atlas-ti.[183]

[182] The grounded theory methodology was originally set up by Anselm Strauss and Barney Glaser. Their first book, *The Discovery of Grounded Theory: Strategies for Qualitative Research* (Strauss A. and Glaser B., 1967) was published in 1967. Then they separately wrote a series of articles and monographs, the most relevant are: Glaser B., 1978; Glaser B., 1992; Strauss A. L., 1987. Then Anselm Strauss published in collaboration with

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The Analysis starts with the 'coding' which consists of a line-by-line analysis: I highlight some words, sentences, or even entire paragraphs and attributes a code to these highlighted parts called '*quotation'*. The code is a more or less conceptual name or label of a phenomenon. Once one code has been used, the researcher must be aware of it and looking for other phenomenon which could also be label with the same code. The coding was not inductive since I have set up a list of five codes in the theoretical framework: , '*scientific expertise*', '*precautionary principle*', '*overcoming the Nimby label*', '*juridical arguments*', and '*recognised national or international NGOs*'. This list stems from the interviews made with the NGOs and from the initiatives sponsored by the NGOs. To begin with, '*scientific expertise*' is the main object of the studies. The '*precautionary principle*' and the '*Nimby label*' popped up in the interviews while the possible recourse to '*juridical arguments*' stems from the fact that numerous local NGOs undertook legal actions against incineration plant projects. Finally, I thought about national NGOs because they can be a solution to overcome the Nimby label and as I have shown in chapter 3, three national NGOs (Greenpeace, FNE, and CNIID) are engaged against the incineration of waste. However, I have kept an open mind in order to favour the emergence of new codes which fit the theoretical framework of

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Juliet Corbin (Strauss A. and Corbin J., 1990; Strauss A. and Corbin J., 1997; Strauss A. and Corbin J., 1998; Strauss A. and Corbin J., 1999.

In the 60's, at the time when Strauss and Glaser set up the grounded theory, mainstream American Sociology had become Durkeimian. Ethnography and the Chicago school were considered as anecdotal or journalistic. In Sociology, there was a paradigm about the need to product scientific theory using quantitative methods, following the model of natural sciences. Ethnography was considered only as a possible developer of interesting questions to be answered using quantitative methods. While the 2nd Chicago school, through notably Herbert Blumer, defended ethnography and the right to be unscientific by criticizing the epistemological assumptions of quantitative researches, Glaser and Strauss considered that the study of human being in the interpretative researches should be scientific. This means that grounded theory should seek to produce theoretical propositions which are testable and verifiable, and which could be used to predict future events. Furthermore the theories should be produced by a clear set of replicable procedures. During this 'modernist phase' of qualitative research (see Denzin N. K. and Lincoln Y. S., 2003, p.16), a series of other researchers, such as Bogdan and Taylor (Bogdan R. and taylor S., 1975), Circourel (Cicourel A. J., 1964) or Lofland (Lofland J., 1971), also attempted to formalize qualitative methods.

[183] Atlas-ti has been developed on the basis of the logic of grounded theory. It does make any analysis by itself; it is a tool which facilitates the management of the data. Each step of the coding process can be realised with the software. In a first stage, the researcher codes what is called the 'primary documents': texts, images, and also audio and video records. The parts of the documents which are coded are the 'quotations'. Then, if necessary, the researcher may group the codes in 'families' and starts to built categories. Finally, the 'network manager', a graphic interface, allows the elaboration of the relations between categories.

An advantage of this software is that it makes the management of a large amount of primary documents easier, and it is also easier to find back the quotations which have lead to the building of the concepts. ATLASti is a powerful organizer for the grounded theorists. However, Atlas-ti has a drawback, which is the small surface of the computer screen, and consequently of the 'network manager', which is the tool used to established the relationships between concepts and codes. Thus this makes more difficult to have a general overview of all the codes and concepts, and the way they are related; that is of the emerging theory. A researcher who deals with a small number of primary documents may be more at ease with a pen and some paper cards.

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the strategies of mobilisation of scientific expertise. Then, I evaluate the grounding of each code, that is, the relative importance of each type of argument through the number of quotations for each code.

In fact, the main common point with the grounded methodology is that I resort to the coding for the analysis of the data. The two main differences are, first that I do not make an 'open coding' and the analysis is only partially inductive; I set up a list of possible codes (which come from part II) before starting the analysis of the documents. Second, since I studied the discourse of only two NGOs, I cannot build a theory as the Grounded Theory does, reaching a theoretical saturation point.[184] Indeed, from the perspective of the Grounded Theory methodology the more the sampling (theoretical or not) is systematic and widespread, the more conditions and variations will be discovered, and thus the greater will be the explanatory power of the theory produced. Having just two cases, however, does not preclude the construction of the grounded theory or at least the formulation of an initial version of such a theory. However its validity/credibility is likely to be limited. The theory speaks for the population from which it has been derived; it could, however, be applied to other similar cases.

To conclude, I resort to coding and Atlas-ti because they provide a clear set of procedures for the analysis. The procedures are explicit and hence the results more open to external assessment.

II. *AREN*

The analysis of the discourse of the NGO *AREN* (*Angers Roseraie Environnement*) is based on 15 documents published by the NGO between April 2003 and 2005, that is, roughly during the *'specifications'* stage (May 2003-December 2005). These documents are press releases, minutes of the speech of the NGO during public meetings sponsored by the grouping of *communes*, and letters and open letters addressed to the public authority (see the detailed list in the appendix "Sources of Data"). Each document is roughly of A4 page length. The NGO published some newsletters, but they were for an internal use only: they were sent to its members and not to the wider public or to the public authority. It was through press releases that *AREN* informed the wider public about its positionings and or initiatives.

[184] The theoretical saturation is "the point in category development at which no new properties, dimensions, or relationships emerge during analysis" (Strauss A. and Corbin J., 1998, p. 143). When theoretical saturation is reached, the refining stage is over, the researcher can move to the integration of the theory.

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AREN did not resort to the same strategies *Collectif Inciner'àtort*. The NGO used mainly and extensively the following types of argument: '*juridical arguments*' '*overcoming the NIMBY label*', and *'scientific expertise'*.

Scientific Expertise

AREN resorted much more to '*Scientific expertise*' than *Collectif Inciner'àtort* to gain '*credibility*'. It clearly tried to gain '*cognitive credibility*' by adopting a '*mobilisation*' strategy to confront scientific expertise. *AREN* quoted 16 times 'scientific expertise'. Taking again the types of scientific expertise developed in the section III.1 of this chapter, the NGO makes reference to '*certified scientific expertise*' (16 quotations), these are: DRIRE (5 quotations), Ministry of Health and INVS (4 quotations), INSERM (2 quotations), INVS (2 quotations), Professor Viel (2 quotations), and professor Belpomme (1 quotation). The expertises of DRIRE are reports concerning the quantities of emission of pollutants by the incinerator plant of *Angers*. The other expertises are about the sanitary impact of incineration: the Ministry of Health ordered to INVS the realisation of a sanitary impact study around the incinerator of *Angers*, two studies about the hazards posed by dioxins published by INSERM in 2000 and 2002, two epidemiological studies carried out by Professor Viel in 2000 and 2003, and a popular book written by Professor Belpomme. More information about these expertises can be found in sub-section III.1 of this chapter. In the text, *AREN* designates the scientific expertises by the name of the author or of the organisation and/or the date of publication; the content of these expertises are summarised in a brief way. For example, in the press release dated 28 December 2003, *AREN* states: "*A sanitary study carried out in 2001 by the ministry of health, on the demand of our NGO, states that 95.000 inhabitants in Angers, Sainte-Gemmes-sur-Loire et Les-Ponts-de-Cé, are exposed to this pollution and that the risks for health are not inconsiderable*." [185]

Juridical Arguments

Besides the '*mobilisation*' strategy, *AREN* adopted a 'complementary' strategy and tried to gain '*moral credibility*' through the mobilisation of '*juridical arguments*'. In fact, these are

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[185] *AREN*, "*Cadre de vie, santé environnement*", press release, 28 December 2003 (ATLAS-ti Primary Document P 1)
Translated by the author – orgininal version: « *Une étude sanitaire réalisée en 2001 par l'Etat, ministère de la santé, à la demande de notre association, indique que 95.000 habitants à Angers, Ste-Gemmes-sur-Loire et Les-Ponts-de-Cé sont exposés à cette pollution et que des risques pour la santé ne sont pas négligeables.*»

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the most used types of argument used by *AREN*: in the 15 documents *AREN* recoursed 46 times to '*juridical arguments*'. I have found the two types of '*juridical arguments*', but the NGO resorted more to 'regulatory norms' (34 quotations) than to 'sentences' (12 quotations). All these juridical arguments concern, not the new incineration plant project, but the old generation incineration plant which is still running in the area of *La Roseraie*.

In order to gain *credibility*, *AREN* makes references to four '*sentences'* unfavourable to incineration. The two sentences which were passed by the *tribunal administratif* (administrative court) of Nantes in 2002 are the most quoted (8 quotations). The court sentenced the grouping of *communes* of *Angers* and some municipalities for the non respect of the urbanism laws. The legal actions were undertaken by *AREN*. The third sentence was pronounced by the Magistrate's court of *Angers* for the non-respect of the norms of emission of pollutants (2 quotations). The fourth sentence, which is quoted twice, was passed by the European Court of Justice against France for the non-implementation of the European Directive 2000/76/EC on the incineration of waste (this directive notably sets up more constraining norms for the emission of pollutants). The sentences are designated by the date of their pronouncement, for example in the press release of the 21st of March 2003, *AREN* states: *"[…] the administrative court of Nantes well sentenced on 19th of December 2002, quashing the two modifications of the urbanism plan and the planning permission for the building of an extension and for the conformation to the standards, decisions taken by the elected decision-makers in 1997 and 1998"*.[186]

The 'regulatory norm' arguments consist of references mainly to the non-respect by the incineration plant of the norms of emission of pollutants (18 quotations), to the non-respect of the urbanism law (11 quotations), but also of references to the non-respect of the norms about the classified facilities (3 quotations) and to the legitimacy to participate to the public debate (2 times). The norm of emission of pollutants which is by far the most invoked is the European directive 2000/76/EC on the incineration of waste (14 quotations). The NGO, however, does not quote directly; it makes reference to its date of enforcement, for example in the press release dated 22nd April 2003: *"on the 1st of January 2006, this incinerator will have to stop running, because it will not comply with the new norms to be enforced on 28th*

[186] *AREN*, "*Usine d'incinération de la roseraie: imprévoyance ou mauvais calcul* ? », press release, 21 March 2003 (ATLAS-ti Primary Document P 4)
Translated by the author – orgininal version : « *comme l'a si bien jugé le tribunal administratif de Nantes le 19 décembre 2002, en annulant les deux modifications du plan d'occupation des sols et les deux permis de construire des travaux d'extension et de mise aux normes, décisions prises par les élus locaux en 1997 et 1998.* »

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December 2005".[187] The other 4 references are ministry orders about rates of emissions of pollutants. The recourse to the urbanism law consists of three references to the rules of urbanism generally speaking, and to the urbanism plan set up by the grouping of *communes* (eight quotations). The reference to the urbanism plan, which forsees an alternative site, is quite detailed, for example: "the urbanism plan approved on the 1st of July 1996, forsees a site in the East of the urban area, at the border between *Saint Barthélémy-d'Anjou* and *Saint Sylvain-d'Anjou*"[188] On the contrary, the references to the urbanism law are vague, for example in the open letter dated 23 May 2003, the NGO claims that *"the urbanism law and the regulations concerning the classified facilities will not allow its [the new incinerator] realisation"*.[189] The three references to the classified facilities law are also vague and are quoted together with the reference to the urbanism law. At last in the 2 reference concerning the legitimacy of *AREN* to participate to the public debate, the NGO quotes the law about the Local Commission for Information and Monitoring, for example: *"L'AREN [...] affirms again that it plays its role and is within its right when it expresses itself within the Local Committee for Information and Monitoring [...]. We remind that the Local Committees for Information and Monitoring [were] created by the law of the 30th December 1988"*.[190]

Overcoming the NIMBY label

For *AREN* 'overcoming the NIMBY label' was an important issue; I have found this argument 16 times in its discourses – the same number as '*scientific exepertise*'. In this '*complementary*' strategy to gain '*moral credibility*' avoiding the egoistic label 'NIMBY', *AREN* recoursed to four arguments: 'LUSU' (8 times), 'Alternative Site' (6 times),

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[187] *AREN*, "*Usine d'incinération, pourquoi ne pas dire la vérité aux Angevins*?", press release, 22 April 2003 (ATLAS-ti Primary Document P 3).
Translated by the author – orgininal version : «*le 1er janvier 2006, cet incinérateur devra cesser de fonc-tionner, car il ne satisfera pas aux nouvelles normes exigibles au 28 décembre 2005*»

[188] *AREN*, "*Usine d'incinération de la roseraie: imprévoyance ou mauvais calcul* ? », press release, 21 March 2003 (ATLAS-ti Primary Document P 4).
Translated by the author – orgininal version : « *Le schéma directeur approuvé le 1er juillet 1996, prévoit un site à l'est de l'agglomération en limite de St Barthélémy-d'Anjou et de St Sylvain-d'Anjou* »,

[189] *AREN*, "Lettre ouverte à Monsieur le president de la commnauté d'agglomération d'Angers", open letter, 23 May 2003 (ATLAS-ti Primary Document P 11).
Translated by the author – orgininal version: « *Le droit de l'urbanisme et la réglementation des installations classées ne permettront pas sa [de l'incinérateur] réalisation* »

[190] *AREN*, "*Usine d'Incinération, L'AREN, acteur de la démocratie participative locale",* press release, 10 october 2003 (ATLAS-ti Primary Document P 14).
Translated by the author – orgininal version: « *L'AREN réaffirme qu'elle est dans son rôle et aussi dans son droit, lorsqu'elle s'exprime au sein de la CLIS (Commission d'information et de surveillance), [...]. Faut-il rappeler que les CLIS [sont] issues de la loi du 30-12-1988* »

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'Generalisation' (1 time), and 'juridical argument' (1 time). Let's start with the 'generalisation'. The NGO resorted to the 'generalisation' claiming that *"AREN […] does not try to protect the backyard of the neighbouring residents, it goes further, it aims at protecting the health of the residents of the whole urban area, because everybody knows that dioxins do not stop at the boulevard d'Arbrissel."*[191] The 'juridical argument' consists of arguing that the existing urbanism plan should be implemented: *"the residents do not practise NIMBY, that is, Not In My Back Yard, when they ask for the implementation of regulation documents of the urbanism plan"*.[192]

When it recourses to the two intertwined arguments '*LUSU*' (Local Unadapted Site Use) and '*Alternative Site*', the NGO does not explicitly defend itself against the NIMBY label. *AREN* simply develops these two arguments; without quoting the term NIMBY. Eight times it claims that the site of *La Roseraie,* which hosts the existing old generation incineration plant, is not adapted to a new incineration plant because the site is at *"the junction of a highly dense residential area and of a market gardening area, as the administrative court underlined, and on an exiguous piece of land which does not offer enough space for the future"*,[193] that it is claimed that the setting up of a new incineration plant would be a Local Unadapted Site Use. Concerning the '*Alternative site*' argument, six times the NGO claims that an alternative site which has not the drawbacks of *La Roseraie* was available. For example, in a minute of the speech of the NGO at a public meeting sponsored by the public authority, the NGO states that "*the new site of replacement is foreseen in the urbanism plan of the urban area of Angers which was approved on the 1 July 1996, selected following a multi-criteria study […], and an agreement among fifty municipalities […]. […] This is the business park of Saint Barthélémy-Anjou / Saint Sylvain- d'Anjou, which is well served by infrastructure transport and far away*

[191] *AREN*, "*Usine d'Incinération, L'AREN, acteur de la démocratie participative locale*", press release, 10 october 2003 (ATLAS-ti Primary Document P 14).
Translated by the author – orgininal version: « *L'AREN en disant des vérités au sein de la CLIS n'essaie pas de protéger une soi-disant « arrière-cour » de riverains, elle vise bien au delà, la santé des angevins, car tout le monde sait bien que les dioxines ne s'arrêtent pas à la verticale du boulevard d'Arbrissel !* »

[192] *AREN*, "*Usine d'incinération, pourquoi ne pas dire la vérité aux Angevins*?", press release, 22 April 2003 (ATLAS-ti Primary Document P 3).
Translated by the author– orgininal version: « De la part des habitants, ce n'est pas vouloir pratiquer le « NIMBY », c'est-à-dire « pas dans mon arrière cour », que de demander l'application des documents de planification règlementaires. »

[193] *AREN*, "*Usine d'incinération, pourquoi ne pas dire la vérité aux Angevins*?", press release, 22 April 2003 (ATLAS-ti Primary Document P 3).
Translated by the author – orgininal version : « à la jonction d'une zone dense d'habitations et d'une zone maraîchère, comme l'a si bien souligné le tribunal administratif, et sur un terrain exigu qui ne réserve pas l'avenir. »

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from residential areas."[194] Thus, the NGO tried to overcome the NIMBY label arguing that another site which better suits the hosting of an incineration plant was available. However, as we saw in the previous sub-section, the residents neighbouring the site of *Saint Barthélémy d'Anjou* did not consider the issue in the same way… Furthermore, the 'alternative site' argument is in contradiction with the aim of 'generalisation'.

Summary-Conclusion

AREN adopted a '*mobilisation'* strategy to gain '*cognitive'* credibility but above all it tried to gain '*moral'* credibility: with 46 references to '*juridical arguments*' and 16 to '*overcoming the Nimby label*' the attempt to gain '*moral credibility*' was much more important than the attempt to gain '*cognitive credibility*' with 16 '*mobilisation*' of scientific expertise.

The NGO refers only to '*external certified scientific expertise*'; it does not quote any internal source or experience-based sources. The references to *'scientific expertise'* are quite precise concerning the sources but rather vague concerning the content. The '*juridical arguments*', 'regulatory norms' and 'sentences', mainly refer to the non-respect of the urbanism laws, and to the non-respect of the norms of emission of pollutant set up by the European Directive 2000/76/EC about the incineration of waste, respectively. At last *AREN* also tried to '*overcome the Nimby label*'.

III. Collectif Inciner'à tort

The raison d'être of *Collectif Inciner'àtort* is its opposition to the local project of setting up an incinerator next to the city of *Angers,* and to waste incineration more generally speaking. The analysis of the discourse of this NGO relies on eight newsletters it published between May 2005 (number 1) and January 2006 (number 8). These newsletters were thus published during the second stage, the *'specifications'* stage. Even if the grouping of *communes Angers Loire Métropole* officially abandoned the incineration plant project in December 2005, the NGO continued to publish newsletters until March 2008. These newsletters were distributed

[194] *AREN*, "*Mémo Réunion assos 7 avril 2004*", minute of the NGO's speech at a public meeting sponsored by the public authority, 7 April 2004 (ATLAS-ti Primary Document P 12).
Translated by the author – original version: « Le site nouveau de remplacement est prévu au schéma directeur de la région angevine, approuvé le 1er juillet 1996, retenu après analyse multi-critères […], et accord des cinquante *communes* , […]. […]. Il s'agit de la zone d'activités de St Barthélémy-Anjou / St Sylvain- d'Anjou, en particulier du fait de sa bonne desserte et de son éloignement des quartiers d' habitation. »

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to some residents and personally addressed to each of the elected local decision-makers of the grouping of *communes*.

The cornerstone of the argumentation of the NGO is that it claims to be an alternative informer for the residents and for the decision-makers. It claims this role four times in its newsletters (newsletters N°1, 2, 4 and 8). For example, in its first newsletter, *Collectif Inciner'àtort* states that *"the grouping of communes focus its communication on incineration, without any debate. In order to fill in this gap, we propose to bring other information, so that the elected decision-makers could make their decision fully informed"*[195] the NGO does not denounce the decision-makers, it does not claim that they are bad or corrupted; it points out a structural problem concerning the sources of expertise of the decision-makers. *Collectif Inciner'àtort* clearly states that it does not mistrust the local decision-makers, but believe that their sources of information were not diversified, that the decision-makers only heard one discourse without any contradictory advices. The NGO also argues that the choice of incineration resulted from habits and laziness of the technical department: "*They are the technical departments in charge of the dossier which have to provide them [the decision-makers] with the elements of the decisions when they make their choice. But they can not take again ready made solutions anymore. Many solutions take again existing technologies because of routine, laziness, or sometimes by complicity.*"[196] And it argues that to make their decision, "*the duty of the elected decision-makers is to require optimum expertises*."[197] The perception of the NGO is that the possible adverse health effects of waste incineration, and the advantage of the alternatives, were simply not debated by the decision-makers. The NGO claims its competencies twice, for example in the newsletter N°2: "*the novelty is that the citizens have the possibility, notably thanks to the internet, to attain a degree of competencies and engineering equal [to the elected decision-makers]*."[198] It also claims its moderation in

[195] Translated by the author – original version: « La communauté d'Agglo organise toute sa communication sur l'incinération, sans avis contradictoires. C'est pour combler ce vide que nous nous proposons de vous apporter d'autres éléments d'information afin que les élus prennent leur décision en complète connaissance de cause. », La Lettre d'Information N°1, Collectif Inciner'à tort, May 2005

[196] Translated by the author – original version: « Ce sont les « services » en charge des dossiers qui doivent leur apporter les éléments de décisions au moment de faire des choix. Mais ils ne peuvent plus désormais se complaire dans la facilité. Bien des solutions proposées reconduisent l'existant par routine, par paresse, ou par complicité parfois. », La Lettre d'Information N°2, Collectif Inciner'à tort, May 2005

[197] Translated by the author – original version : « le devoir des élus c'est d'exiger une expertise optimale », La Lettre d'Information N°2, Collectif Inciner'à tort, May 2005

[198] Translated by the author – original version : « La nouveauté, c'est que les citoyens ont la possibilité, grâce à internet entre autre, d'atteindre un niveau de compétence et d'ingéniérie au moins égal », La Lettre d'Information N°2, Collectif Inciner'à tort, May 2005

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the form: "*constructive attitude and dialog, presentation of objective elements, reflection and proposals*."[199] To conclude, the NGO introduce itself as a source of alternative expertise in order to enlighten the decision-makers, who are then free to make their own decision. *Collectif Inciner'àtort* seems to agree that scientific expertise have the power to decide the very terms of deliberation (see chapter 1, sub-section I.1 for further details about the "very term of deliberation").

In order to gain '*credibility*', *Collectif Inciner'àtort* resorted to the arguments I developed in the theoretical framework: '*overcoming the NIMBY label*', '*scientific expertise*', '*precautionary principle*', and '*juridical arguments*'. But it also used an argument I did not develop in the theoretical framework: '*internal technical expertise*'.

Scientific Expertise

To confront scientific expertise, the NGO adopted a strategy which is more similar to '*mobilisation*' than to '*challenge*' or '*demarcate*' scientific expertise. However, in the event it did not really mobilise scientific expertise in its discourses: it talks about scientific expertise or expert only four times, and the references to scientific expertises are rather vague. It never quotes any scientific study to support their position, notably, they do not quote a study they know, the epidemiological studies carried out by professor Viel. Therefore, the NGO resorted to another strategy that I label '*superficial'*.

The first reference concerns the incineration plants of Bourgoin-Jallieu for which the veterinary services advised against the cultivation of cucurbitaceae and the consumption of local eggs (newsletter N°5). In the second reference, the NGO makes one reference to epidemiological studies, but without quoting precisely any source, it just talks about "*Epidemiological studies concerning diseases developed by the residents neighbouring waste incinerators gives clearer and clearer results: increasing of the number of cancers, malformations at birth, fertility decreasing*".[200] The third reference is about a conference organised by the NGO, and in which 300 persons came to hear "*the professor [Lesné] who*

[199] Translated by the author – original version : « esprit constructif et dialogue, présentation d'éléments objectifs, réflexion et propositions de citoyens responsables préoccupés par le nécessaire respect de l'Homme et de la nature, aujourd'hui et demain. », La Lettre d'Information N°4, Collectif Inciner'à tort, Sept. 2005.
[200] Translated by the author – original version : « […] les études épidémiologiques sur les maladies que subissent les voisins d'incinérateurs de déchets donnent des résultats de plus en plus clairs : augmentation du nombre de cancers, malformations à la naissance, baisse de fertilité, … », La Lettre d'Information N°5, Collectif Inciner'à tort, Sept. 2005.

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listed all the pollutants which invade our atmosphere, and who uttered his shout of alarm"[201]. Only the name of the professor is specified; there is no information concerning his actual competencies. Finally, the NGO talked about the local practitioners who asked the public authority to give up the project, invoking the precautionary principle.

This lack of quotation of scientific expertises, however, does not mean that the NGO does not talk about the pollution due to waste incineration and its effects on health. On the contrary, still following a '*superficial'* strategy they talk about the problems entailed by dioxins twelve times in the newsletters N°1, 2, 4, 5 and 6, but they do not support their claim by any precise quotation of scientific expertises. For example, In the first newsletter, the NGO takes position against Professor Narbonne, a pro-incineration expert I already talked about in the section I of this chapter: "*No, professor Narbonne, the risks linked to incineration are not globally under control. […]. Chimneys of incineration plants emit thousands of molecules which have not been studied yet*"[202]. In the newsletter N°3, concerning health hazards, it claims that "*the link between exposure and its disastrous consequences is being confirming by the development of specific cancers*"[203], and in the newsletter N°5 it states concerning the environmental pollution that "*dioxins and lead are the eggs and in the vegetables which grow next to the chimney of the incinerator*".[204]

Precautionary Principle

In the meantime, the NGO is aware of the scientific uncertainties; in the newsletter N°5 it mentions this issue twice: "*considering sanitary uncertainties and the climate of anxiety the incinerators create for the population, we are against any new setting up in the département*

[201] Translated by the author – original version : « le professeur décliner tous les polluants qui envahissent notre atmosphère et pousser son cri d'alarme», La Lettre d'Information N°3, Collectif Inciner'à tort, June 2005.
[202] Translated by the author – original version : «*NON, Mr NARBONNE, les risques liés à l'incinération ne sont pas globalement maîtrisés. […]. Il sort des cheminées des incinérateurs des milliers de molécules qui n'ont pas encore été étudiées.* », La Lettre d'Information N°1, Collectif Inciner'à tort, May. 2005.
[203] Translated by the author – original version : « Le lien entre l'exposition et ses conséquences désastreuses se confirme de plus en plus avec le développement de cancers bien précis.», La Lettre d'Information N°5, Collectif Inciner'à tort, Sept. 2005.
[204] Translated by the author – original version : « la dioxine et le plomb sont dans les œufs et les légumes qui poussent à l'ombre des cheminées de l'incinérateur.», La Lettre d'Information N°5, Collectif Inciner'à tort, Sept. 2005.

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[…]"[205]; and "*when it [the link between exposure and disastrous consequences] will be clearly established, it will be too late to say: if we knew…!*"[206]

As a consequence of this aw*AREN*ess, *Collectif Inciner'àtort* adopted a '*complementary*' strategy and it (briefly) invokes, three times, the precautionary principle: in the newsletter N°5, it states that "*the physicians of Saint-Barthélemy invoke the precautionary principle and ask the grouping of communes to renounce the incineration plant project*"[207]; at the beginning of the newsletter N°5, the NGO claims "*today the precautionary principle must prevail"*; and it concludes the newsletter N°6 with "*And if the precautionary principle was simply applied?*"[208] The question which pops up now is whether the precautionary principle is invoked because of the actual and documented scientific uncertainties or because it is likely to reinforce the supposed anxiety of the wider public?

Internal Technical Expertise

The NGO adopted a '*complementary*' strategy and tried to gain '*cognitive authority*' resorting to a large extent to an argument I did not develop in the theoretical framework: an '*internal technical expertise*'. In fact, *Collectif Inciner'àtort* dedicated most of its newsletters to '*technical expertises*' about alternative technologies for the waste treatment.

The '*technical expertis*e' consists of reports made by the members of the NGO. Excepted in the newsletter N°1[209], these reports were written following the visits of existing waste treatment facilities which use alternative technologies. This technical expertise has been gained by resorting to internal competencies: some members of the NGO who have technical competencies (mostly engineers) went to visit 10 waste treatment facilities which use alternative technologies throughout France, they then wrote down a report of their visit which

[205] Translated by the author – original version : « *Compte tenu des incertitudes sanitaires et du climat d'inquiétude que les incinérateurs créent dans les populations, nous sommes contre toute nouvelle création dans le département*.», La Lettre d'Information N°5, Collectif Inciner'à tort, Sept. 2005.
[206] Translated by the author – original version : « *Quand il sera clairement établi,[le lien entre l'exposition et ses conséquences désastreuses] il sera bien temps de dire : si on avait su !»,* La Lettre d'Information N°5, Collectif Inciner'à tort, Sept. 2005.
[207] Translated by the author – original version : « *Les médecins de St-Barthélemy invoquent l'application du principe de précaution et demandent à l'agglo de renoncer au projet d'incinérateur»,* La Lettre d'Information N°5, Collectif Inciner'à tort, Sept. 2005.
[208] Translated by the author – original version : « *Et si l'on appliquait tout simplement le principe de précaution ?* », La Lettre d'Information N°6, Collectif Inciner'à tort, Oct. 2005.
[209] In this newsletter, the reports concerning the selective sorting in the region *Alsace* and in the town of *Segré* are not based of visits; they were written down, however, by some members of the NGO.

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was published in the newsletters.[210] Roughly speaking, the reports are made of four elements: a short description of the process; quantitative data concerning the visited facility such as the capacity of treatment or the number of employees; the cost of the facility and of the treatment (per ton of waste treated); and the main advantages (more or less explicitly by comparison with incineration). These reports can be labelled as '*technical internal experience-based expertises*'.

The NGO refers 11 times to '*technical expertise*'; roughly, there is one report per newsletter. But the number of times is not enough to show that these '*internal technical expertises*' are central to the argumentation of the NGO. Indeed, each expertise is quite long by comparison with the other types of arguments. Indeed, the ten newsletters consist of two pages A4 format. By and large, the pages are divided into frames: a main central frame which occupies around three quarters of the surface, and a series of two-five secondary small frames. And the central frames are dedicated to the '*internal technical expertises*', while the lateral ones contain other kind of arguments or information such as the initiatives sponsored by the NGO (in the appendix see the newsletter N°1 as an example of the composition of the newsletters). There is, however, one exception: the newsletter N°5, in which the main frame is dedicated to the pollution by existing incineration plants (as a matter of fact most of the arguments developed in the theoretical framework are used in this newsletter N°5).[211]

Finally, the NGO clearly claims the seriousness of its technical expertise, arguing that it stems from grounded analyses of the alternatives to incineration, notably through visits of existing waste treatment facilities: *"Collectif Incin'àtort does not assert without knowing. It gets information: visits of the landfill site of Champteussé-sur-Baconne, of the mechanical biological sorting site of Launay Lantic […], and of the incineration plant of Lasse"*.[212] These

[210] Small groups made of members of the NGO went to visit the ten following sites: incineration plant of *Lasse* (newsletter N°1), mechanical biological treatment site of *Launay lantic* (newsletter N°2), methanisation facility of *Amiens* (newsletter N°3), landfill of *Champteussé-sur-Baconne* (newsletter N°4), selective sorting system of *Lille* (newsletter N°4), site of collective composting of *Saint-Philibert de Bouaine* (newsletter N°5), thermolysis incineration plant of *Arras* (newsletter N°7), plasma torch of *Cenon* (newsletter N°7), the mechanical biological and methanisation facilities of V*AREN*nes-Jarcy (newsletter N°8).

[211] The newsletter n. 6 is also a bit different: one page is dedicated to an argumentation against incineration while the other page is made of a table which summarize the advantages and drawbacks of the alternative technologies.

[212] Collectif Inciner'à tort, « La Lettre d'Information N°1 », May 2005.
Translated by the author – original version: *« Le Collectif n'affirme pas sans savoir. Il s'informe : visites du centre d'enfouis-sement de Champteussé-sur-Baconne, du centre de tri mécano-biologique de Launay Lantic, en Côtes d'Armor et de l'usine d'incinération de Lasse* », La Lettre d'Information N°1, Collectif Inciner'à tort, May 2005.

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forms of '*local*' technical expertise are likely to be serious since they have been conducted by individuals who have certified technical and scientific qualifications.

Overcoming the NIMBY label

Neither the NIMBY, nor the LULU, or NIABY (Local Unwanted Land Use) arguments have been used by *Collectif Inciner'àtort*. In fact, the NGO did not try to gain '*moral credibility*' through an explicit argumentation trying to overcome the NIMBY label. However, it did in an implicit way. Indeed, the NGO implicitly adopted a LALU (Local Alternative Land Use) strategy. In the newsletter N°4, it implicitly argues that the selected site would be adapted for the hosting of an alternative technology: "*[methanisation] seems to be very well appropriate to our city*".[213] Moreover it stated that it is engaged in order to "*favour the realisation of alternative solutions to incineration*".[214] As we will see below, the NGO centered its argumentation on the visiting of facilities which use alternative technologies.

The NGO, however, used on one occasion the term 'NIMBY', but it was to criticize the attitude of the elected decision-makers. In the newsletter N°2 it talks about a possible 'reversed NIMBY' attitude of certain decision-makers because on the occasion of a conference organised by the public authority on the sanitary risk of dioxins produced by incinerators: only the decision-makers of the municipalities directly neighbouring the site participated to this conference; the decision-makers of the municipalities which were more distant from the site did not participate. Using the term 'reversed NIMBY', the NGO wants to underline also that the decision-makers are more interested by what happens next to them by what happens far away from their district.

Juridical Arguments

Collectif Inciner'àtort does not resort to '*sentences'* in order to gain '*moral credibility*'. As a matter of fact, it did not undertake legal actions against the grouping of *communes*. The NGO resorted four times to the '*regulatory norms*' argument (mainly in the newsletter N°5), but not always to gain '*moral credibility'*. In fact, *Collectif Inciner'àtort* does not trust the established norms and adopted a strategy which is analogous to the '*demarcation*' strategy

[213] Translated by the author – original version : « *Le dispositif adopté nous paraît particulièrement bien adapté à notre agglomération.* », La Lettre d'Information N°3, Collectif Inciner'à tort, June. 2005
[214] Translated by the author – original version : « *pour la mise en œuvre de solutions alternatives à l'incinération* », La Lettre d'Information N°4, Collectif Inciner'à tort, Sept. 2005

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defined for scientific expertise, putting forward the fact that the norms are fickle: "*the continuous evolution of the norms is the proof [that the risks of incineration are not globally under control], […].*"[215] According to the NGO, the norms do not guarantee the absence of sanitary risks: "*those who currently decide to build incinerators, even complying with the norms, take the risk to be one day under accusation of poisoning*"[216]. For the NGO, the (European) norms simply define a right to pollute (twice: newsletter N°1, and 5), and "*are only a compromise between technical possibilities of the measurements and economical constrains*".[217]

However, in the newsletter N°5, in a paragraph *Collectif Inciner'àtort* makes two references to the norms in order to gain '*moral credibility*'. It argues that a pollution was made by two incineration plants which exceeded the norms: the incinerator of "*Gien-Arrabloy released during five months in 2004 dioxins rates 6 800 times superior to the authorised norm, entailing a pollution by dioxins of the eggs of the neighbouring farmings*", and concerning the incinerator of *Bourgoin-Jallieu*, "*analyses indicated dioxins rate two times superior to the European norm for the eggs*".[218]

Summary-Conclusion

NGO *Collectif Inciner'àtort* tried to gain '*credibility*' by adopting a combination of a reduced '*mobilisation*' of scientific expertise and a very substantial set of '*complementary*' arguments. It is likely that *Collectif Inciner'àtort* thought that the '*scientific expertise*' arguments would have had little impact on the wider public and on the public authorities because of the uncertainties concerning the impact of dioxins on health. Indeed, *Collectif Inciner'àtort* tried to gain '*cognitive authority*', but it mobilised only a few times and a very vague way '*scientific expertise*' (4 times) while it complemented its discourses with some

[215] Translated by the author – original version : « Les normes en évolution constantes en sont la preuve [que les risques liés à l'incinération ne sont globalement pas maitrisés]», La Lettre d'Information N°1, Collectif Inciner'à tort, May. 2005.
[216] Translated by the author – original version : « *Ceux qui décident actuellement de construire des incinérateurs, même aux normes, prennent le risque de se voir un jour accusés d'empoisonnement.*», La Lettre d'Information N°5, Collectif Inciner'à tort, Sept. 2005.
[217] Translated by the author – original version : « *normes européennes, qui ne sont qu'un compromis entre la faisabilité technique de la mesure et les impératifs économiques*», La Lettre d'Information N°5, Collectif Inciner'à tort, Sept. 2005.
[218] Translated by the author – original version: «*Gien-Arrabloy […] a rejeté pendant 5 mois en 2004 et au début 2005 des taux de dioxine 6 800 fois supérieur à la norme autorisée*»; «*analyses effectuées en juin 2005 présentant des taux de dioxine 2 fois supérieurs à la norme européenne dans les œufs*», La Lettre d'Information N°5, Collectif Inciner'à tort, Sept. 2005.

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references to the '*precautionary principle*' (3 times) and above all to '*internal technical expertise*'.

In fact, to gain '*cognitive credibility*', *Collectif Inciner'àtort* extensively resorts to a type of argument I did not develop in the theoretical framework: '*internal technical expertise*', which consist of reports made by small groups of members of the NGO following visits to waste treatment facilities which use alternative waste treatment technologies. The aim of the NGO was to provide the wider public and above all the public authority with an alternative expertise discussing the advantages and drawbacks of the alternatives to incineration. The NGO resorted eleven times to this form of expertise. But the number of quotations alone does not enable the evaluation of the importance of the '*internal technical expertise*' since these eleven times occupy almost all the place in the tenth newsletter of the NGO.

Collectif Inciner'àtort did not try that much to gain '*moral credibility*': it resorted in a brief way to '*juridical arguments*' (5 times) concerning the norms of emission, and implicitly tried to '*overcome the Nimby label*' through a Local Alternative Land Use (LALU) strategy.

IV. Conclusion

From the analysis of the discourses of two local NGOs, it appears that scientific expertise was not the main argument for gaining '*credibility*', and that they resorted to other types of arguments to bring the wider public and the public authorities round to their view. This means that even though sanitary risks were their main concern for these two NGOs, they considered that '*scientific expertise*' was not the best argument to convince the wider public and the public authority. It is probable that the NGOs did not mobilise '*scientific expertise*' that much in their discourses because they were aware that scientific uncertainties were high. And therefore, they may think that they could not gain much '*cognitive credibility*' in the eyes of the wider public and of the public authorities because of these uncertainties. More generally, the nature of the uncertainties is likely to influence the strategy of NGOs: in case of uncertainties in favour of NGOs, these latter are likely to adopt a combination of '*mobilisation*' and '*complementary*' strategies, whereas if the uncertainties are not in favour of NGOs, they are more likely to adopt a combination of '*demarcation*' and '*complementary*' strategy.

From a theoretical point of view, the concept of '*strategies of mobilisation*' of scientific expertise (mobilisation, challenge, demarcation, amd complementary) seems to work to analyse the attempts of the NGOs to gain '*cognitive credibility*'. The '*strategies of*

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mobilisation' presents some similiraties with the 'boundary-works' developed by Gyerin (Gieryn T. F., 1983; Gieryn T.F., 1995; Gieryn T. F., 1999c).[219] The aim is the same: strengthening its own position while weakening, if possible, the position of the opponents. The main difference is that '*boundary-works*' are made by the members of the scientific community, while the '*strategies of mobilisation*' applies to the stake holders engaged in decision-making processes. More generally, the '*strategies of mobilisation*' can be applied to any situation in which scientific expertise is mobilised by "lay people", that is, by individuals or groups who are not members of the scientific community which produce the expertises.

The analysis of the arguments used by the two NGOs enables the drawing up of two distinct profiles. The argumentation of NGO *AREN* characterises its '*opposition*' to the project, trying to '*gain moral credibility*', while *Collectif Inciner'àtort* resorted to an argumentation made of '*propositions*', trying mainly to gain '*cognitive credibility*'.

AREN, the NGO which engaged first in the decision-making process, developed an argumentation of '*opposition*': it merely aimed at the abandonment of the incineration plant project sited next to the homes of its members; it was in substance a NIMBY attitude. Indeed, the argumentation of *AREN* combined: '*mobilisation*' of scientific expertise, '*juridical arguments*', and '*overcoming the NIMBY*'. The '*mobilisation*' of expertise aimed to highlight the possible sanitary dangers of incineration, while the '*juridical arguments*' were linked to legal actions engaged by the NGO against the public authority which did not respect some procedures in previous decision-making processes. In order to overcome the NIMBY label, *AREN* combined the LUSU (Local Unadapted Site Use) and '*alternative site*' arguments. This was a more subtle and argumented way to say 'Not In My BackYard'. This last point is supported by the fact that *AREN* became less active after the shifting of site a few kilometres away.

Collectif Inciner'àtort, the NGO which engaged after the shifting of site, had a more constructive discourse than *AREN*. Its discourse was made of '*propositions*', trying in the meantime to gain '*cognitive credibility*'. The discourse combined the following arguements: a '*superficial*' mobilisation of expertise; a substantial '*internal technical expertise*'; and to overcome the NIMBY label, it resorted to the LALU (Local Alternative Site Use) argument. The sanitary risks were the main motivation of the initial engagement of the NGO against the

[219] See chapter 7

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incineration plant project. Moreover, it sought and found the epidemiological studies which argue that incineration may be risky. However, it resorted only to a '*superficial*' mobilisation of scientific expertise. This shows that the NGO did not count that much on the sanitary and environmental risks to gain '*credibility*'.[220] The NGO focused on the alternatives technologies to incineration. In fact, they really did not hold a NIMBY position. They adopted a LALU (Local Alternative Land Use) argumentation: they did not question the choice of the site, but the choice of the waste treatment technology. To support this position, they tried to gain '*cognitive credibility*' by producing their own '*internal technical expertise*' about the alternative waste treatement technologies.

This analysis of the discourses of the NGOs supports the idea that the public (here the local NGOs) are likely to make a constructive contribution to technical-scientific decision-making processes through the plurality they bring and the widening of the framing of the issue under discussion (Nowotny H., 2003). It also confirms that the NIMBY is likely to be fairly positive and that the public may have a good grasp of and reasonable concern for health and welfare, which are ignored by technical and administrative elites (see for ex.: Fiorino D., 1995; Matheny A. and Williams B., 1985; Kraft M. and Clary B., 1991; Hunter S. and Leyden K. M., 1995). However, there are, at least in this research, two distinct degrees of contribution. The first one, '*opposition*', is the less rich as it only highlights important drawbacks of the solution selected by the decision-makers. The second one, the '*propositions*', is richer: it provides the decision-makers with alternative solutions. Further research is necessary, however, to assess whether these two degrees of contribution are just linked to the studied decision-making process or whether they are well grounded.

From a theoretical perspective point of view, this analysis of the discourses of the NGOs supports the view of the '*critical*' PUS scholars, that is, that the public is able to reflect on the source of their knowledge (media or others): they are able to evaluate the quality of the knowledge they have acquired (Irwin A. and Wynne B., 1996; Irwin A. and Michael M., 2003).[221]

To finish, from a methodological point of view, it has appeared during the analysis that the number of quotations may be not enough to evaluate the grounding of the respective codes.

[220] See chapter 3
[221] See chapter 7

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Indeed, a quotation may cover only one sentence or an entire page. The length of a quotation must be thus taken into account.

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CONCLUSION

Many Science Studies scholars agree that there is a crisis of tradional expertise and that public participation is a solution to solve this crisis, thanks to the plurality the public brings (Wynne B., 1992; Fischer F., 1999; Weale A., 2001; Callon M., Lascoumes P. Barthe Y., 2001; Nowotny H., Scott P. Gibbons M., 2001; Nowotny H., 2003; Jasanoff S., 2003; Grundmann R. and Stehr N., 2003; Dietrich H., Schibeci R., 2003/10/1).[222] However, while these scholars focus mainly on 'non-standard' knowledge, this research shows that the public can be able to bring valid alternative 'standard knowledge', that is, alternative '*certified*' scientific expertises. Moreover, both analyses of the public engagement and of the mobilisation of scientific expertise by the local NGOs show that, in the eyes of the local NGOs, the problem of the expertise provided to the local public authorities is the framing of the issue under discussion (see Jasanoff S., 2003). The local NGOs put under discussion the fact that the sanitary and environmental risks entailed by incineration were not taken into account by the local public authorities and their experts. The local NGOs did not question that much the other possible drawbacks of traditional scientific expertises highlighted by Science Studies scholars: confusion between facts and values (Jasanoff, S, 1990, p. 229; see also Nowotny H., 2003; Jasanoff S. and Lynch M., 1998; Funtowicz S. and Ravetz J., 1992), and confusion between knowledge and personal interests (Jasanoff, 1990).[223] In fact, the local NGOs rather trust '*certified*' expertises, no matter who ordered them.

[222] See Chapter 1
[223] See Chapter 1

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In part II, I have tried to assess the actual public involvement and its impact on the outcome and degree of controversy of local decision-making processes. Whereas at the national level public participation from the outset of decision-making processes is guaranteed by the *Commission Nationale de Débat Public*, there is no similar obligation at the local level. The legal framework which rules public involvement gives at a lot of freedom to the local decision-makers and little constraints. And as a matter of fact, there was very little political will to engage the public; almost no decision-maker went further than the few legal constraints: top-down public engagement was late and consisted mainly in communication, and there was very little consultation and participation. Only two out of the ten studied groupings of *communes* started to sponsor (non-compulsory) participation and consultation initiatives toward the beginning of the second stage.

Most of these decision-making processes were controversial: in all the cases, some local NGOs stood against the incinerator project sponsoring many bottom-up engagement initiatives. Above all, they were not satisfied with the framing of the issue: according to them the local public authorities did not consider the environmental and sanitary risks entailed by the incineration of wastes. The relative absence of public participation strongly suggests that the local public authorities studied in this research do not perceive public participation as a solution to diminish the degree of controversy. In other words, the solution proposed by many Science Studies scholars to solve the problem of traditional expertise, and more particularly to widen the framing of the issue under discussion, was not applied at all by the studied local public authorities. Moreover, in the typology of the engagement mechanisms developed in this research, I have found no trace of the highly particpative mechanisms studied in the (Anglo-Saxon) Science Studies literature and listed by Rowe and Frewer (2005). I have identified, however, new types of participation mechanisms (sponsored late in the decision-making processes) which had not been identified by Rowe and Frewer. This suggests that exchanges between the French and Anglo-Saxon experiences are likely to enrich the range of mechanisms possibily useful to solve the problem of traditional scientific expertise on the one hand, and to diminish the degree of controversy of decision-making processes on the other hand.

Because of this lack of top-down public engagement, I cannot draw a straight conclusion about the impact of top-down public engagement on the outcome and above all on the degree of controversy of the decision-making processes. In other words, it has not been possible to actually verify whether the public participation recommended by the Science Studies scholars has actually, in terms of degree of controversy, a positive impact on the decision-making

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processes. I can only draw two hypotheses. First, top-down participation is sponsored when there are still issues to be decided is likely to diminish the degree of controversy, as happened in the only case in which some top-down participation initiatives were sponsored. Second, consultation might be less effective at diminishing the degree of controversy than participation: the only case in which consultation initiatives were sponsored, the decision-making process remained highly controversial until the abandonment of the incineration plant project. It is likely that the consultation came too late, and that the local NGOs no longer trusted the public authority.

From a theoretical point of view, the property space of the public engagement mechanisms, derived from those developed by Rowe and Frewer (2005), has allowed the carrying out of a detailed analysis of the public engagement along the decision-making processes. In particular, the concept of flow of information and the distinction of seven classes of public engagement (no engagement, bottom-up and top-down communication, consultation, and participation) have been useful to classify the mechanisms. The further distinction of sub-types of mechanisms through the definition of eight key characteritics has not been central for the present empirical research. It enables, however, a classification of the mechanisms according to explicit criteria. But the high number of criteria (8) does not allow the development of a synthetic property space, which is consequently a bit heavy and complicated to manage.

The distinction of the three key chronological stages of the decision-making processes has made possible a chronological analysis of the public engagement. The definition of the stages for the ten studied decision-making processes has not been easy because the decision-making processes did not develop exactly in the same way. But finally, I have succeeded in defining the three stages and thus to make comparable the ten cases. More generally, it may be difficult to apply the same stages to other kind of local decision-making processes, more or less important are likely to be necessary. In order to adapt the definition of the key chronological stages to other kind of decision-making processes one must just keep in mind that what delimits each stage is the importance of the issues under discussion, and that along the decision-making processes, the degree of manoeuvre diminishes.

Finally, the degree of controversy of a decision-making process is difficult to define because it is relative: a decision-making process is more or less controversial by comparison with other decision-making processes. I have attempted to make more reliable the evaluation of the degree of controversy through the combination of four indicators (presence/absence of *ad hoc* NGOs; high/low level of bottom-up communication; high/low level of protest

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initiatives; and presence/absence of legal actions). The use of the mean as a reference for distinguishing the low and high level could be applied here because the dispersions of the values are high. In case of low dispersion, another technique of evaluation of the degree of controversy should be used. To finish, it would be interesting to confront the definition of degree of controversy with new grounds in order to evaluate the extent to which this definition could work as such in new contexts or if it would be necessary to refine or modify it.

In the literature, the studies, such as the typology developed by Rowe and Frewer (2005), or the evaluation of mechanism made by Renn and al. (1995), focus on the single mechanisms. In this research, I have first developed a typology, that is, I have also dealt with the single mechanisms. In a second step, considering that the point time when an initiative is sponsored is fundamental, I have attempted to deal with all the mechanisms used during the entire decision-making processes, but the evaluation was mainly quantitative. A more global evaluation of the engagement mechanisms is necessary: rather than evaluating the mechanisms separately, it is necessary to study the efficiency of systems of public engagement mechanisms, that is, of plans of public engagement which combine engagement initiatives at the various stages of the decision-making processes. To make such an analysis, the '*key chronological stages*' combined with the '*significant characteristics*' are likely to be helpful.

It is likely that an efficient plan of public engagement should combine the three classes of mechanisms (information, consultation, participation). Such a plan should start with large degree of publicity for the project, traditional information mechanisms such as newsletters and press releases are likely to work well. In the meantime, it should conduct an evaluation of the impact of the project on the public opinion in order to evaluate the public willingness to engage in the decision-making process. If there is no public willingness, information initiatives are likely to be sufficient; there would probably be few participants to consultation or participation initiatives. In case of public willingness to engage, the sponsoring of participation or consultation initiatives should be considered. Moreover, it is likely that an engagement plan should flexible in order to adapt to the evolution, which may be unexpected, of the decision-making process and more precisely of the reactions of the public. Such plans could be used as hypotheses to be tested through new empirical research. In order to implement and assess the efficiency of such plans, collaborations with consultancy firms dealing with participation or with grouping of *communes* could be considered.

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Moreover, the legal framework, has evolved in the last years and tends toward more public engagement from the outset of the decision-making processes, notably thanks to the convention of Aarhus which the objective is to "*[…]guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters[…]*." (article 1). With this convention, and notably with article 6, the participation of the public is really guaranteed. However, this article 6 seems not to be fully implemented in French law: there is a discrepancy between the two *décrets*: while *Décret n° 2002-1187 du 12 septembre 2002 Journal Officiel du 21 septembre 2002* has enforced the convention in French Law as such, and thus guarantee public engagement, *Décret n° 2006-578 du 22 mai 2006* concerning the information and participation of the public with regard to environmental matters only partially updates the Aarhus convention in the French environmental *Code*, and does not guarantee the participation of the public from the outset of decision-making processes. The latter *décret* only extends the decision-making processes in which a public enquiry must be carried-out.[224] And as I have already stated, public enquiries come late in the decision-making processes. Thus, the *Code de l'environnement* only partially takes into account the Aarhus convention. It would thus be interesting to study the public engagement in environmental decision-making processes which started from 2003 onward in order to evaluate the extent to which the Aarhus convention is actually implemented in local decision-making processes, and therefore to evaluate if there is more public participation and/or consultation from the outset of the decision-making processes. In other words, is the legal framework used by the local decision-makers the one of *Décret n° 2002-1187*, that is the Aarhus convention, or the one of *Décret n° 2006-578,* that is, the French environmental *Code*.

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[224] Substantially, this *Décret* only provides for a generalisation of the *public enquiries* to "*[…] the decisions of authorisation, approval or execution of environmental planning or facilities for which an impact study or a impact note, and for which the State or a Public entity is the developer. […]*".[224] The developer must make available the impact study or impact note to the public who must have the possibility to write down its observations on registers. Then "*[…] 3° The developer makes the synthesis of these observations and make it available to the public according processes that he determines.[…]*"[224] (Emphasis added).

In fact, only the National Public Debate Commission fulfils the Aarhus convention provisions concerning public engagement. But the National Public Debate Commission only deals with a limited number of environmental matters since it is charged with the development of town and country planning or infrastructure projects of national interest of the state. This Commission does not deal with local projects such as the setting-up of waste treatment facilities. Moreover, concerning article 6, the report on the implementation of the Aarhus Convention in French law only focuses on the National Public Debate Commission arguing that the French legislation fully takes into account the Aarhus convention, and it does not talk about the local environmental decision-making processes such as the setting up of incineration plants (See United Nations, Economic Commission for Europe, *Aarhus Convention Implementation Report submitted by France*, 13 April 2005, UN doc. ECE/MP.PP/2005/18/Add.8, at http://www.unece.org/env/documents/2005/pp/ece/ece.mp.pp.2005.18.add.8.e.pdf).

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The very practical question of the implementation of public engagement initiatives and of their costs should be dealt with. If local public entities cannot afford the organisation of public engagement mechanisms or if they have not the internal competencies to organise them, theoretical discussions, such as those made by the Science Studies scholars, lose their interest. The problem of the competences could be solved, for example, by the setting up of a national public entity which could provide *ad hoc* advice and practical procedures of public engagement to the local public authorities. Another solution could be to resort to private consulting companies specialised in the sponsoring of communication-consultation-participation initiatives.

As an aside, since participation is likely to spread in the future, it would be interesting to set up a database of the decision-making processes which resorts to top-down consultation or participation mechanisms. Such a database would notably facilitate the evaluation of the impact of these classes of mechanisms on the degree of controversy of the decision-making processes.

Better grounded conclusions can be drawn about the impact of the bottom-up public engagement on the decision-making processes. In the three decision-making processes in which the incineration plant project has been abandoned, the level of bottom-up communication was very high during the *'specifications'* stage (the second stage), and it was much higher than the level of top-down communication. In the other cases, those which ended with the opening of an incineration plant, the level of bottom-up communication was low. So, a high level of bottom-up communication during the *'specifications'* stage (the second stage), superior to the level of top-down communication is likely to lead to the abandonment of the incineration plant project. Therefore, beyond the fact that public participation is likely to improve the quality of the expertise, in front of resolute local NGOs, the public authority has an interest in making the public participate. Further research is necessary in order to know whether a high level of bottom-up communication is sufficient to lead to the abandonment of an incineration plant project, or whether it is necessary that the bottom-up is superior to the top-down communication, or whether both conditions are necessary.

Part III, which deals with the mobilisation of scientific expertise by the public, supports the position of the Science Studies scholars who argue that the public (here the local NGOs) is likely to make a constructive contribution to the decision-making processes (Wynne B., 1992; Fischer F., 1999; Weale A., 2001; Callon M., Lascoumes P. Barthe Y., 2001; Nowotny H.,

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Scott P. Gibbons M., 2001; Nowotny H., 2003; Jasanoff S., 2003; Grundmann R. and Stehr N., 2003; Dietrich H., Schibeci R., 2003/10/1), and that citizens may have a good grasp of and reasonable concern for health and welfare, which are ignored by technical and administrative elites (Fiorino D., 1995; Matheny A. and Williams B., 1985; Kraft M. and Clary B., 1991; Hunter S. and Leyden K. M., 1995).[225] Therefore, the results of this research support a fairly positive view of the impact of (top-down and bottom-up) public engagement on the overall expertise provided to the local public authorities, and consequently on the outcome of technical-scientific decision-making processes. As Domique Pestre puts it: "*criticisms, refusals and oppositions to sciences, to technologies and to their direct and indirect effects have not only been massive in the past, butthey have always been essential for the development of safer technological systems.[…] Today – this is a matter of principle to be considered specifically for each situation – these people and contestations should (probably) be carefully listened to."* (Pestre D., 2007, p. 8)

To start with, highlighting the sanitary and environmental riskd entailed by the incineration of household wastes, the NGOs widened the framing of the issue under discussion. The main motivation of the NGOs to engage in the decision-making processes was the environmental and sanitary risks entailed by the incineration of wastes. According to the NGOs, these risks were not considered by the local public authority. Secondly, searched for evidence to support there worries, the local NGOs brought valuable alternative scientific expertise in the debates. Indeed, almost all the NGOs sought scientific expertise in order to get an insight into the impact of waste incineration on health and the environment in a first step, and to monitor the pollution in a second step.

The local NGOs were not able to produce their own expertise but they were able to mobilise '*external*' scientific expertises. They obtained it in two ways: directly, seeking and selecting themselves the sources, and/or indirectly, asking to their public authority to order and pay for the sought expertise. The NGOs which mobilised indirectly scientific expertise did so because of its high costs they could not afford. Almost all the local NGOs succeeded in obtaining all or at least part of their sought expertise. Moreover, very few NGOs declared that they did not seek scientific expertise at all, and three that they renounce to seek certain expertises. Almost all the NGOs invoked the '*division of labour*' between the engaged NGOs. Therefore, this important recourse of the local NGOs to scientific expertise shows that local

[225] See chapter 7

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NGOs are likely to make valuable contributions to local public decision-makings, bringing a plurality in the expertises as Nowotny H., Scott P. Gibbons M (2001) claim. Certification is a key characteristic of the scientific expertise mobilised by the local NGOs. As a matter of fact, when they directly mobilised scientific expertise, the local NGOs selected to a very large extent '*external certified'* sources: public institutions or officially accredited laboratories. They almost never mobilised '*internal*' expertise, probably due to the lack of internal competences, or '*external experience-based*' expertise, most likely because they find that the latter is reliable. The fact that the scientific expertise mobilised by the local NGOs were mainly '*certified*' supports the claim that the public is likely to bring valid expertises to the decision-making processes.

Concerning the expertise indirectly mobilised, the NGOs rather trust the results of the expertises ordered and paid by their public authority because they were carried out by officially accredited, that is certified, laboratories. This suggests that both the public authorities and the local NGOs agree on what counts as reliable scientific expertise. This agreement is likely to prevent the NGOs and public authority from making 'boundary works', that is, from disputing what counts as scientific expertise and what does not (Gieryn T.F., 1995; Gieryn T. F., 1999c).[226] This does not mean that the parties agree on the content of the expertise but that a there is a shared basis on which the debates can develop. This agreement is likely to facilitate the debates which would be organised in the framework of participation mechanisms.

The results of the analysis of the discourses of two NGOs suggest that local NGOs may make (at least) two types of contribution to the decision-making. The first one, '*opposition*', is the less rich than the second one, '*propositions*'. In the '*opposition*' contribution, the public highlights important drawbacks of the solution selected by the decision-makers bringing scientific expertise to support its opposition. In the '*propositions*' contribution, the public provides the decision-makers with alternative solutions supported by economical-technical expertises. Further researches are necessary, however, to assess whether these two types of contribution are just linked to the studied decision-making process or whether they are well grounded types.

For none of the two studied *ad hoc* NGOs scientific expertise was the key argument to convince the wider public and the public authorities. One NGO tried to gain '*cognitive*

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authority' resorting to a combination of '*superficial*' and '*complementary*' strategy. The '*complementary*' strategy consisted of resorting massively to '*internal technical expertise*' about the alternative technologies to incineration. The other NGO also tried to gain '*cognitive authority*', and to do so, it resorted to a '*mobilisation*' strategy. But this was not the core of its strategy. In fact, it tried to gain rather '*moral credibility*', resorting to '*juridical arguments*', than '*cognitive credibility*'. Since the scientific expertise was in favour of the position of the local NGOs, not surprisingly, the two NGOs did resort to the '*challenge*' or '*demarcation*' strategy. From a meta-theoretical point of view, this analysis supports the critical PUS scholars' position who claim that the public is able to reflect on the source of their knowledge (media or others), that is, that they are able to evaluate the quality of the knowledge they have acquired (Irwin A. and Wynne B., 1996; Irwin A. and Michael M., 2003).[227]

From a theoretical point of view, The novel property space of the sources of scientific expertise I have developed, and which defines four types of scientific expertise (internal certified, internal experience-based, external certified, and external experience-based) works quite well in this research and has allowed me to identify the type of sources of scientific expertise the local NGOs selected. This property space can be probably used as such to analyse the sources of scientific expertise of the public in various contexts.

The typology set up by Mike Mikael (1996) concerning the reasons for not seeking scientific expertise ('*division of labour*', '*mental constitution*', and '*deliberate choice*') does not fit well this research. The '*mental constitution*' reason was not invoked by the interviewed NGOs, and I have had to modify the '*division of labour*' type since the local NGOs considered the division of labour more among the NGOs than between them and experts. Only the '*deliberate choice*' could be used as such, without any modifications.

At last, the gain of '*cognitive credibility*' and '*moral credibility*' seem to be grounded concepts and allow the analysis of the strategies the local NGOs resorted to in order to bring the wider public and the public authorities round to their views. Within the strategy of gaining '*cognitive credibility*', the four '*strategies of mobilisation of scientific expertise*' ('*mobilisation*', '*challenge*', '*demarcation*', and '*complementary*') has allowed me to analyse the use of scientific expertise in the discourses of the local NGOs. In the light of the empirical study, I have added, however, a fifth strategy: the '*superficial*' strategy. This strategy consists

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of making reference to results of expertise, but which are vague and without quoting any sources. In other words, this is a superficial version of '*mobilisation*'. In order to build up a well grounded theory, the theoretical framework developed here should be confronted with new grounds, with other types of technical-scientific controversies which involve NGOs.

The '*strategies of mobilisation*' presents some similirities with the 'boundary-works' developed by Gyerin (Gieryn T. F., 1983; Gieryn T.F., 1995; Gieryn T. F., 1999c).[228] The aim is the same: strengthening its own position while weakening, if possible, the position of the opponents. The main difference is that '*boundary-works*' are made by the members of the scientific community, while the '*strategies of mobilisation*' applies here to the stake holders engaged in decision-making processes. More generally, the '*strategies of mobilisation*' can be applied to any situation in which scientific expertise is mobilised by "lay people", that is, by individuals or groups who are not members of the scientific community which produce the expertises.

To finish, it should be remembered that the analysis relies on the declarations of the NGOs gathered through semi-structured interviews. In other words, the analysis is based on the declaration of the interviewees. The interviewees may have forgotten some sources, and not all the NGOs were able to precisely quote their sources. It is, however, reasonable to make the hypothesis that the sources which spontaneously popped up in the interviews were the most important in the eyes of the interviewee. And thus, it is possible to suggest that even though the image of the sources is a bit blurred, it remains representative. Now that the sources of scientific expertise of the NGOs have been identified, a more accurate image could be obtained through a questionnaire, asking for each source if the NGO used it or not, and why.

Concerning, the validity of the results of this research, I have tried to provide with details the characteristics of the 10 selected decision-making processes and of the studied NGOs. I leave it to the reader the possible extension of the results to other decision-making processes or situations. The extension of the results of this research should be done case by case using the characteristics evoked above in order to evaluate the similarity of the cases.

[228] See chapter 7

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APPENDIX

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THE TEN DECISION-MAKING PROCESSES

This appendix introduces each of the ten decision-making processes selected for this research. The cases are introduced one by one indicating their main features, that is, the public entity in charge of the waste treatment, the engaged NGOs, the key dates of the decision-making process, the running of an existing incineration plant, the type of site (urban or rural), and the outcome of the decision-making process. These key features are summarised in table 22 below. The specificities of each decision-making process are also stated. In brief, the aim is to enter into the thickness of the reality of the cases. This appendix has been written down using some of the main concepts developed in this research: the three chronological stages ('*framing*', '*specifications*', *'realisation'*), and the types of NGO ('existing', 'ad-hoc').

As I have already stated, a number has been assigned to each case. The criterion of assignment is chronological. The case which ended most recently is the number one and the oldest is the number eleven. These numbers are used for the entire research. Due to the impossibility of realising the interviews, the case number 7 "*Nîmes*" has been finally removed from the study. Consequently, this case is not introduced, and the numeration goes directly from VI to VII.

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Table 23. The main features of the eleven decision-making processes

N°	Case	Name of the public entity in charge of the project	Ending Date	Starting Date	Duration Of the Decision-making process (in Year)	Opening of an incineration plant	Replacement of an old incinerator	Number of NGOs Which mobilised
1	*Gueugnon*	SMEVOM du Charolais-Brionnais et Autunois	2005	1998	7			2
2	*Angers*	*Angers* Loire Métropole	2005	2003	2		X	2
3	*Thiviers*	SMD3	2004	1995	9			2
4	*Arras*	SMAV	2004	1995-1996	9	X (thermolysis facility)	X	1
5	*Lasse*	SIVERT	2004	1995	9	X	X	1
6	*Le Havre*	SEVEDE	2004	1998	6	X	X	3
7	~~*Nîmes*~~	~~SITOM Sud Gard~~	~~2004~~	~~1996~~	~~8~~	~~X~~		~~2~~
8	*Villers-Saint-Paul*	SMVO	2004	1993	9	X	X	2
9	*Calce*	SYDETOM 66	2003	1992	9	X		4
10	*Guichainville* (Evreux)	SETOM	2003	1994	9	X		3
11	*Vaux-le-Pénil*	SMITOM	2003	1992	9	X	X	5
					Average: 8 years			Average: 2,5

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I. Gueugnon

Gueugnon is a small town with less than 9000 residents in east-central France. In May 1998, the beginning of the '*framing*' stage was marked by the creation of the mixed syndicate '*SMEVOM (Syndicat Mixte d'Elimination et de Valorisation des Ordures Ménagères) du Charolais-Brionnais et Autunois*'. This entity was put in charge of a study to find a solution to the problem of household waste treatment. No old incineration plant had to be replaced in *Gueugnon*. Very quickly, about a month after the creation of the mixed syndicate, incineration was selected as the solution for the wastes that were not sorted. In March 1999, *SMEVOM* put the private company GIRUS in charge of a feasibility study. In the meantime, under the presidency of the *Préfet*, the *département* plan for the disposal of household and similar waste made compulsory the recourse to incineration. The results of the pre-study on incineration were communicated to *SMEVOM* in January 2002. At that date, the site was already selected, in the town centre, next to a steelworks facility. The reason behind this choice is that the mixed syndicate wanted to sell the steam produced through the waste incineration to this industrial facility. In November 2002, only few months after the incineration plant project was publicized, the local NGO *VPIG* (*Vigilance Projet Incinérateur Gueugnon*), which was opposed to the incineration plant project, was created by a group of residents. This NGO was very active, and organised a lot of bottom-up communication initiatives. Another NGO, *Autun Morvan Ecologie* also stood against the project. However, it did not undertake many actions; it mainly sent information to its members. In fact, this existing environmental NGO follows the incinerator project through *VPIG*. As *Autun Morvan Ecologie* stated, the site was rather far from the town of *Autun*, and thus it did not feel very concern by the issue. Both NGOs are members of *Coordination du CNIID*.

The second stage of the decision-making process, the '*specifications*' stage, started in January 2004 with the transformation of the status of *SMEVOM* from study to realisation syndicate. Since it was necessary to modify the local urban plan (*Plan Local d'Urbanism*) to site the incineration plant, a public inquiry was realised in June-August of the same year. But the *commissaires enqueteur*s draw unfavourable conclusions. In September, the *département* plan for the disposal of household and similar waste was modified to give the possibility to recourses to alternative waste treatment techniques. After the local elections in March 2004, the majority of the *Conseil Général* changed. Then, the new *Conseil Général,* who was opposed to the incineration plant project, took the competence of waste treatment in January 2005. In March, the *SMEVOM* gave up the incineration plant project because the new *Conseil*

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Général refused to contribute to it financially. A new decision-making process for the establishment of a totally new *département* plan for the disposal of household and similar waste began in 2006. All the options are opened again, and both local NGOs *VPIG* and *Autun Morvan Ecologie* have been involved from the outset through participation in all the meetings of the decision-makers. The meetings take place every two months. At the date of the interviews, 4 among 12 waste treatment scenarios were selected. The NGO *Autun Morvan Ecologie* also participated to the establishment of the previous *département* plan, but its participation was reduced to the two plenary sessions, which took place twice a year.

In this research, I study the period 1998-2005; from the creation of the mixed syndicate in May 1998 to the given up of the incineration plant project in March 2005. The first round of this decision-making process lasted seven years. I have not studied the second round, which started after March 2005. The main reason for this choice is that at the date of the interviews it was not over yet, and I as I stated in chapter 2, I have studied exclusively completed decision-making processes.

II. Angers

Angers is a 157 000 residents city situated in the western part of France. It is the chef town of the *département* of *Maine-et-Loire*. The entity in charge of the waste treatment is the grouping of *communes Angers Loire Métropole*. The community of *communes Angers Loire Métropole* is composed of 31 municipalities and 270 000 residents.

A first incineration plant was built in 1974 on a site situated in an outlying and at that time new area called *La Roseraie*. In 1998, following the exposure in the media of the existence of pollution caused by dioxins emitted by the incineration plant of Gilly-sur-Isère (in the South East of France), some residents of *La Roseraie* set-up a NGO called *Association Roseraie Environnement, AREN*. Since its creation this NGO was strongly opposed to the existing incineration plant. It has not been possible to identify the dates of the '*framing*' stage. It is only possible to state that the '*framing*' stage was before May 2003.

Indeed, May 2003 was the start date of the '*specifications*' stage; when the grouping of *communes Angers Loire Métropole* set up a first committee, a *comité de pilotage*, to thinks about the construction of a new incineration plant to replace the 'old' existing incineration plant. Two solutions were under discussion: the renewal of the existing plant or the building of a new one on another site. In May 2004, on the basis of the *comité de pilotage*'s thoughts,

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Angers Loire Métropole decided to transfer the waste incinerator to a neighbouring small municipality, *Saint-Barthélemy-d'Anjou*. The site is at the border between the city and the country side, in a lightly urbanized industrial area. Immediately, an existing NGO the *Association de Défense de la Zone Industrielle, ADZI,* (Association for the Defence of the Industrial Zone) took a strong stand against the construction of the incineration plant. In September 2004, a second *comité de pilotage*, the charge of which was the completion of the incineration plant, was set up by *Angers Loire Métropole*. In December 2004, an informal new NGO, '*Collectif Inciner'à tort'* (Association Incineration Is Wrong) was especially created, by the members of *ADZI*, other NGOs, and residents. The aim of this NGO is to fight against the plan of the particular incinerator of Saint *Barthélemy d'Anjou* and more generally against incineration as a solution to the problem of household waste. The '*specifications*' stage ended in December 2005, when the grouping of *communes* dropped incineration in favour of an alternative technique, the mechanical-biological sorting.

With regard to the mobilisation of the NGOs, two sub-stages can be identified: before and after the choice of the site. While the NGO *AREN* was active during the phase of the choice of the site*, Collectif inciner'à tort* was active once the site of *Saint-Barthélémy* was done. *AREN* was strongly opposed to the existing incinerator and its renewal whereas *Collectif Inciner'à tort* stands against the incineration plant project and against the principle of incineration generally speaking. Both NGOs are members of *Coordination du CNIID*. A third local NGO, an 'existing' one, *La Sauvegarde de l'Anjou*, which has been set up long before the new incineration plant project, was not opposed to incineration, and did not care a great deal about the new incineration plant project. As a matter of fact, this NGO did not answer my requests to interview them. This NGO did not undertake any action against the project. Both NGOs *AREN* and *La Sauvegarde de l'Anjou* participate to the *Comité Local d'Information et de Surveillance* (Local commission for information and monitoring) of the existing incineration plant which is currently running.

In this research, I have studied the period January 2003-December 2005: from the creation of the first *comité de pilotage* until the giving up of the incineration plant project. I have not studied the second '*specifications*' stage which concerns the mechanical-biological sorting facility which was not ended at the dates of the interviews. Moreover, this decision-making process lasted only two years, and is thus by far the shortest.

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III. Thiviers

Thiviers is a small town situated in the rural department of *Dordogne*, in the south west of France with a few more than 3000 inhabitants.

The '*framing*' stage started with the setting up of the *département* plan for the disposal of household and similar waste, under the presidency of the *Préfet*. In May 1995, the *département* plan foresaw the construction of a household incineration plant which was to be next to a railway line. Moreover, the incineration plant was to produce electricity and was thus called Energetical Valorisation Unit (*Unité de Valorisation Energétique*).

It was thus in December 1995 that the '*specifications*' began, with the creation of the mixed syndicate *Syndicat Départemental des Déchets de la Dordogne (SMD3)* by the *Préfet.* SMD3 was put in charge to implement the *département* plan. In the event, *SMD3* started to work in 1997. During the same year, the *Conseil Général* voted in favour of the incineration plant. The selection of the site was made in 1999 in collaboration with the French railway company *Société Nationale de Chemins de Fer (SNCF)*. At the end of the same year, five existing NGOs created the informal ad-hoc local NGO *Collectif Halt'incin*. Six months later, in July 2000, following the hype made by *Collectif Halt'incin*, some residents of *Thiviers* created the NGO *Thiviers la Vie*. *Collectif Halt'incin* is member of *coordination du CNIID* whereas *Thiviers la Vie* is completely independent. In 2001, the selection of the site of *Thiviers* was made official. The reasons for this choice were the presence of a freight railway station, the proximity of an Electricité De France (EDF) facility to which to sell the electricity produced by the incineration plant, and a neighbouring quarry which could use the clinker. Local elections took place in 2004. Following these elections, the new *Conseil Général* voted against the incineration plant project set up by the *Préfet* and *SMD3*. In the meantime, the competence of the *département* plan for the disposal of household and similar waste was transferred from the *Préfet* to the *Conseil Général*. These two events marked the end of the '*specifications*' and of the decision-making process with regard to this research.

With the designing of a new *département* plan sponsored by the *Conseil Général,* a new decision-making process started. This second round of the decision-making process includes all the options for the waste treatment technique. In this second round, the *Conseil Général* involved the NGOs: they partipated to all the meetings of the decision-makers (i.e. 20-25 meetings, three hours each). At the date of the interviews, this new decision-making process was ongoing; for this I have focused only on the first round of the decision-making process

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which lasted nine years: from the setting up of the *SMD3* in December 1995 until the given-up of the incineration plant project in June 2005. Finally, no old generation incineration plant used to run at *Thiviers*.

IV. Arras

Arras is the *chef-lieu* of the *département* of *Pas-de-Calais*, in the north of France. *Arras* is a small city with slightly fewer than 50,000 inhabitants. The case of *Arras* is particular since the technology used is not the classical incineration but the thermolysis. The thermolisor of *Arras* is actually the only one running in France. Despite its particularity, I have selected this case because it is considered as an incineration plant by the national NGOs Greenpeace and *CNIID* (see the web-site 'www.france-incineration.org').

In 1995, the grouping of *communes* around the city of *Arras* started to study a solution for replacing an old generation incineration plant through the creation of the entity *Trie Artois Service*. The existing incinerator sited at *Tilloy-les-Mofflaines* had to be closed by the end of 2000 because it did not respect the new norms of emission of pollutants. From the very beginning, the decision-makers eliminated the classical incineration technique because problems with dioxins started to break out and they though that it would have been difficult to make accepted a classical incineration plant by the population. The *framing* was short: the choice of the thermolysis technique was made during 1995. The '*specifications*' stage was longer: it started in 1996 and ended in October 2001. The establishment of the specifications of the thermolysis project took two years, and in April 1998, an invitation to tender was published. The company *Thide Environnment* won the tender in August 2000. The public enquiry took place in January 2001, and the '*specifications*' stage ended in October 2001 with the starting of the building of the facility. In March 2002, *Trie Artois Service* was transformed in the mixed syndicate called *Syndicate Mixte Artois Valorisation (SMAV)* who was put in charge of the waste gathering and treatment. Finally, the thermolysor opened at the end of 2003. *SMAV* groups together four existing grouping of *communes*, among which the Urban Community of *Arras*, which represents 133,000 residents. From the *framing* until the opening of the facility, the decision-making process lasted nine years.

No NGO stood against the thermolysor project. Only one existing environmental NGO, *Arras Nord Nature*, member of the National NGO *France Nature Environnement*, followed the issue since it was member of the Local Committee of Information and Monitoring of the existing incineration plant and is member of the committee of the new thermolysor.

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According to *SMAV*, the residents were little interested in the thermolysor project, and during the meeting information about the selective sorting and the waste treatment, very few questions were asked about the thermolysor.

V.Lasse

Lasse is a small village with a population of less than 247. It is situated in a rural zone, in the *département* of *Maine-et-Loire* in the west of France. The '*framing*' stage started in July 1995: a group of small *communes* set up a mixed syndicate to study a solution for the treatment of the household wastes: the *Syndicat Mixte d'Etude et de Programmation du Traitement des Déchets Ménagers et Assimilés* (*SMEPTDMA)*. In November 1998 the technique of incineration was chosen.

The second stage '*specifications*' started in may 1999 with the creation of another mixed syndicate put in charge of the realisation and the running of the incineration plant. This mixed syndicate has been called *SIVERT (Syndicat Intercommunal de Valorisation et de Recyclage Thermique)*. *SIVERT* did not select a site at the outset of the decision-making process in order "to avoid the NIMBY phenomenon". A small household incineration plant used to run until the end of the 1990's at *Lasse*. The final site, still in the municipality of *Lasse* is in the middle of the countryside. As soon as the municipality of *Lasse* was chosen for the siing of the facility, in summer-autumn 1999, some residents created the ad-hoc NGO *CRITOM (Comité de Réflexion sur l'Incinération des Ordures Ménagères)* and invited *SIVERT* to a public meeting it. *CRITOM* is member of *Coordination du CNIID.* Very quickly, in December 1999, *SIVERT* asked *Préfet* for the setting-up of a local commission for information and monitoring in order to have a place where to meet the NGOs. The operator ONYX-Véolia was selected in December 2000. The public inquiry took place during the autumn 2001.

The end of the '*specifications*' stage and the beginning of the *'realisation'* stage took place in March 2002. After a ten year decision-making process, the incineration plant opened at the end of 2004.

An existing environmental NGO, La *Sauvegarde de l'Anjou*, also participates in the local commission for information and monitoring for the new incineration plant. As in the case of *Angers*, this NGO did not stand against the incineration plant project. During the decision-making process, *SIVERT* also met the farmers and some mushroom gatherers. The results of these meeting have been the improvement of the emission monitoring system, and the setting up of a compensation fund for the farmers in case of pollution by the dioxins.

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VI. Le Havre

Le Havre is a 190,000 population city in the the *département* of *Seine-Maritime* in the region *Haute-Normandie*. By the end of 2000, the city of *Le Havre* had to replace two incineration plants which did not comply with the new norms of emission of pollutants. The '*framing*' stage started toward the end of 1998 it asked to the company *Groupe Merlin* to study a solution for the waste treatment. The chosen site was in the middle of a huge industrial zone, at *Saint-Jean-de Folleville*, far from any housing. Moreover, this industrial zone already hosted pollutant facilities such as a refinery. The '*framing*' stage was short: less than one year after the setting up of a mixed syndicate, *SEVEDE (Syndicat d'Elimination et de Valorisation Energétique des Déchets de l'Estuaire)* was put in charge of the implementation the decision to set-up an incineration plant, which marked the beginning of the '*specifications*' stage in September 1999. The invitation to tender for the construction, and then the selection of the building company, were made between February and December 2000.

SEVEDE was very confident in its project since the building of the facility started in January 2002, before the granting of the authorisation to run by the *Préfet*. No real opposition broke out during the Public Enquiry which was realised in May-June 2002. In July-August 2002, the company Novergie was selected to operate the incineration plant and the Préfet grant its authorisation in September. At the end of 2003, the first trial of the new incineration plant was realised. The decision-making process ended with the official opening which took place in June 2004. This six years decision-making process is the shortest among the ones that ended by the opening of an incineration plant. In all but one other decision-making processes, the building started after the granting of the authorisation to operate. Since the division of the decision-making process into stages is based on the number and importance of the issues under discussion, I have decided to end the '*specifications*' with the beginning of the building.

No ad-hoc NGO was created on the occasion of this decision-making process. The three NGOs which engaged in the decision-making process are 'existing' NGOs. *Comité du quartier des Neiges* is an NGO composed of some residents of one of the two existing incineration plant. It was created in 1995 to fight against the pollution produced by the neighbouring incineration plant. The members of this NGO were not opposed to the new incineration plant project. In fact, *Comité du quartier des Neiges* is not against the incineration technique if the facility is set up in an appropriate site. The two other NGOs, *SOS*

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Estuaire and *Ecologie Pour Le Havre*, are environmental and local. These two NGOs are tightly linked: both are members of the national NGO *France Nature Environnement*, and the later is member of the former. *SOS Estuaire* was created in 1988, on the occasion of the building of the *Normandie* bridge across the *Seine* estuary, while *Ecologie Pour Le Havre* was set up in 1981. *Ecologie Pour Le Havre* deals with the environment, the industrial pollution, and the renewable energy. Initially these two NGOs mobilised against the old incineration plant which did not respect the norms of pollution. In the facts, this is *Ecologie Pour Le Havre* which actually engaged in the decision-making process, with the support of *SOS Estuaire*. Both NGOs were opposed to the incineration plant project, and in favour of an alternative technique, the methanisation.

VII. Villers-Saint-Paul

Viller-Saint-Paul is a small town with a population slightly more than 6,000. It is in the département of *Oise*, less than 100 kilometers north of Paris. The '*framing*' stage started sometime during the second semester 1993: an informal group of mayors asked to a private urban research consultancy to study a solution for the waste treatment in order to replace an old existing incineration plant. At that date, incineration was already a special solution. At the end of 1994, the main lines of the project were defined, and the *département* plan for the disposal of household and similar waste integrated the setting up of an incineration plant in the western part of the département. An existing environmental NGO member of the *Coordination du CNIID*, *Compiègne Ecologie*, mobilised during the public enquiry for the *département* plan because it was against the setting up of an incineration plant in the western part of the *département*. But its engagement did not go much further since the town of *Compiègne* is *"far from the site of Villers-Saint-Paul"* (interview N°11, *Compiègne Ecologie*). In fact, *Compiègne Ecologie* declared that it was satisfied with the mobilisation of another NGO, *Alerte aux Déchets*.

In May 1999, the creation of the mixed *syndicate SMVO (Syndicat Mixte de la Vallée de l'Oise)* marked the beginning of the '*specifications*' stage. February 1999-February 2000 was the period of the invitation to tender for the construction. This is during this period, quite late after the incineration plant project was made public, that the 'ad-hoc NGO' *Alerte aux Déchets* was created by some residents. The initial aim of the NGO was to obtain information about the incineration plant project and to study the alternatives. *Alerte aux Déchets* was also worried because *"the existing incineration plant, at Nogent-sur-Oise, was very polluting, and neither the local elected decision-makers nor the Préfet wanted to close it"*. The strong

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bottom-up engagement of this NGO (the case was 'highly controversial') came late, during the *'realisation'* stage, and thus the decision-making process went on. The invitation to tender for the running of the incineration plant took place between September 2000 and September 2001. In September 2001 the public inquiry was conducted. The second stage of the decision-making process ended little after with the granting of the authorisation to run in December 2001.

The *'realisation'* stage started in March 2002, and finally, the incineration plant officially started to run in April 2004, nine years after the beginning of the decision-making process.

VIII. Calce

Calce is a small village with a population of less than 247. It is in the département of *Pyrénées-Orientales* (66), in the very south of France. The '*framing*' started in October 1992 when the president of the *Conseil Général* asked for a study for the setting of an household waste treatment facility. The private study *Groupe Merlin* recommended the setting up of three incineration plants. However, in 1994, under the presidency of the *Préfet*, the *département* plan for the disposal of household and similar waste foresaw only one incineration plant. In July of the same year, the mixed syndicate *SYDETOD (Syndicat Départemental pour l'Etude en vue de la réalisation d'un dispositif de Transport et de Traitement des Ordures ménagères et autres Déchets)* was set up and put in charge of a study to try to find a solution for the transport and the treatment of the households and similar wastes.

In November 1996, the beginning of the '*specifications* stage' was marked by the creation of a new mixed syndicate, *SYDETOM66 (Syndicat Départemental de Transport, de Traitement et de valorisation des Ordures Ménagères et autres déchets assimilés)* which was put in charge of the realisation and of the management of the facility. Then, for more than two years, until March 1999, *SYDETOM66* searched for a site and encountered a lot of refusals. At least four municipalities refused the siting of the incineration plant on their territory. The town council of *Saint–Hippolyte* initially accepted. Then in front of the opposition of the population, a referendum was organised by the municipality, and the hosting of the incineration plant was finally rejected. At *Rivesaltes*, an appellation d'origine contrôlée wine zone, the town council, partially composed of viticulturists, refused because it was afraid of the contamination by dioxins. The mayor of *Peyrestrotes* gave up in front of the opposition of the local NGO *Vivre à Peyrestrotes*. At *Vivès*, in front of the opposition of the residents, the town council voted against the project. Finally, the town council of *Calce* offered to host the

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facility. In March 1999, *SYDETOM66* selected *Calce* and started the invitations to tender for the building and the running of the facility. During the autumn 2000, the operator and the builder were chosen. Toward the end of 2000, the public enquiry was made. Over the same period, a first meeting of the local commission for information and monitoring took place. *Calce* is one of the rare case in which the local committee for information was set-up, during the second stage, before the *'realisation'* started.

And this is in January 2001 that the *'realisation'* stage started. Finally, the incineration plant opened in July 2003, after a nine year-long decision-making process.

In the study of this case, I have focused on the NGOs which mobilised around the incinerator project in *Calce*. I have not studied the long route made by *SYDETOM66* across the *département* to find a site. Four NGOs, one ad-hoc and three existing, engaged in the decision-making process, that is, participated to the local committees for information and monitoring: *Coordination Environnementale des Pyrénées-Orientales*, *La Hune*, *Charles Flahaut*, and *Frene66*. *Coordination Environnementale des Pyrénées-Orientales* is an ad-hoc NGO, member of the Coordination of *CNIID.* It was created in May 1998 while *SYDETOM66* was searching for a site. This NGO gathers together seven existing NGOs among which Vivre à *Peyrestortes*, some individuals, and one company. Some elected decision-makers are also members of this NGO. From its creation, *Coordination Environnementale des Pyrénées-Orientales* has been against waste incineration. In this decision-making process, this is the NGO which was the most active through the organisation 'bottom-up initiatives' to stand against the project. *La Hune* is an environmental 'existing' NGO. The aim of this NGO, created in 1994, is to inform the elected and private local decision-makers about the environment and the evolution of the legislation concerning the environment. Formally, *La Hune* is independent, but it has tight links with *France Nature Environnement*. Initially, when it engaged in the decision-making process in 1996, *La Hune* was not opposed to the *SYDETOM66*'s project. At that time, this NGO considered incineration as the only available technique to make the transition between the disposal to landfills and a full selective sorting. Furthermore, it thought that one modern incinerator was better than the five old existing ones which used to run. But this position has changed along the decision-making process. Today the NGO is against waste incineration because of heath hazard of the dioxins, and above all, it thinks that it is impossible to have a transp*AREN*t functioning of incineration plants. Both NGOs *Coordination Environnementale des Pyrénées-Orientales* and *La Hune* work together from the beginning of their engagement. But the *La Hune* did not participate in the

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organisation of the 'bottom-up initiatives'; its actions consisted mainly in participating in the local committees for information and monitoring. *Coordination Environnementale des Pyrénées-Orientales* and *La Hune* have no relation at all with the NGO *Charles Flahaut*. *Charles Flahaut* is an old independent environmental NGO created in 1944. Its initial aim was the reforestation of the *département.* Today, it is a multi-purpose NGO for the knowledge and the protection of the nature. It was not opposed to the incineration plant project, and thinks that it was the *"less bad solution"*. At last, *Frene66* is an environmental 'existing' NGO as regards the incineration plant project. *Frene66* groups together 25-30 local NGOs and is member of *France Nature Environnement*. Due to my inability to gain interview, no more information about this NGO could be gathered. However, it seems that it was not very active concerning the incineration plant project. To finish with the groups which mobilised around the incineration plant project, *SYDETOM66* met the chamber of agriculture in 2003 because the viticulturists were worried about the pollution due to dioxins. Following these meetings, some extra monitoring measures were realised, and a compensation fund was set up.

With regard to the 'top-down public engagement', the municipal elections in 2001 were a turning point. The president of the SYDETOM66, who was in favour of the participation of the NGOs and thus who anticipated the creation of a local commission for information and monitoring during the second stage of the decision-making process, was not elected again. The new president was not in favour of the NGOs participation. From this moment, the NGOs encountered difficulties within the committee: they should ask the meetings to be done and they had difficulties to obtain information.

IX. Guichainville

Guichainville is a small town with 2,500 inhabitants. It is in the *département* of Eure in the region of *Haute-Normandie*, in the north-west part of France. The starting point of the '*framing*' stage is the creation of the study mixed syndicate *SETOM (Syndicat mixte pour l'Etude et le Traitement des Ordures Ménagères)*. Between March and July 1994, the research study *Groupe Merlin* was put in charge of finding a waste treatment solution . The 'existing' environmental NGO *Guichainville Environnement* started to stand against the incineration plant project quite early, between 1992 and 1994. This NGO engaged on the occasion of setting up of the *département* plan for the disposal of household and similar waste, which forsaw three incineration plants. *Guichainville Environnement* was created in 1992. The initial

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aim of this NGO was to stand against the transformation of the main road which goes through the village into an express way. Among the twenty-seven studied NGOs, *Guichainville Environnement* is the only one which is member of both national nets *Coordination du CNIID* and *France Nature Environnement*. It is also member of the regional NGO *Haute-Normandie Nature Environnement*.

The decision-making process entered in the second stage in December 1994 with the transformation of *SETOM* from a study to a realisation mixed syndicate. Then, *Groupe Merlin* was nominated as project manager for the study, implementation, and monitoring of the operating of the waste gathering and treatment plans. In 1994-1995 the municipality of *Guichainville* was selected to host the incineration plant; the final decision was made official in March 1997. The invitation to tender for the building started in August 1997 and ended in 1999. Then, in 2000, the public inquiry took place, and the *commissaires enquêteur* gave a favourable opinion to the project. And this is quite late, on the occasion of this public enquiry that the existing local environmental NGO *La Sauvegarde de l'Environnement* engaged in the decision-making process. *La Sauvegarde de l'Environnement* was set up in 1978 to stand against the setting up of a chemical facility in the village. This NGO is member of *Haute-Normandie Nature Environnement*, which is itself affiliated to *France Nature Environnement*. However, this NGO did not mobilise significantly: its action consisted in giving information to, and in supporting, *Guichainville Environnement*. In the event it was the latter which organised and coordinated the 'bottom-up initiatives' to stand against the project.

As soon as the *Préfet* granted the authorisation to operate (March 2001), building started (April 2001). The operator *Novergie* was selected quite late in the decision-making process, in January 2003. The *'realisation'* stage, and thus the decision-making process, ended in January 2004 with the official inauguration of the incineration plant. The first meeting of the local commission for information and monitoring took place before the opening of the facility, during the *'realisation'* stage, in October 2002. From then the frequency of the meetings was one per year.

X. Vaux-le-Pénil

Vaux-le-Pénil is a small town with a 10,000 population situated around forty kilometres in the south-east of Paris, in the *département* of *Seine-et-Marne*. The '*framing*' started with the creation of the *SMECOSOM*, a mixed syndicate put in charge of the study of a solution for the household waste treatment to replace the existing incineration plant. The setting up of an incineration plant was decided upon. In November 1996, the creation of *SMITOM*, a mixed

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syndicate put in charge of the realisation of the project, marked the beginning of the second stage. The siting of the facility just next to the existing incineration plant was decided in June 1997. In September 1997, the SMITOM's project was integrated in the *département* plan for the disposal of household and similar waste. The invitation to tender for the building took place between January 1998 and October 1999. *Groupe Merlin* was selected as project manager in February 1998. Véolia-Onyx was selected in January 2000 to operate the incineration plant. In May 2000, *SMITOM* asked to the *Préfet* for the anticipated creation of a local commission for information and monitoring because it wanted to answer to the worries of the population. The '*specifications*' stage ended in September 2000 with the starting of the building. The public enquiry took place very late in the decision-making process, in February 2001, whereas the building was already started. The Préfet granted the authorisation to operate in April. The first meeting of the local commission for information and monitoring took place by the middle of 2001. Then the meetings took place once a year. Finally, the incineration plant was brought into service in December 2003.

As for the mobilisation of the NGOs, the case of *Vaux-le-Pénil* is very special. While in the other cases one ad-hoc NGO grouped together the interested individuals and some existing NGOs, and as a result two NGOs were mobilised, one ad-hoc and one existing, five NGOs mobilised in the case of *Vaux-le-Pénil*. These NGOs were *AIPPNE (Association Intercommunale pour la Protection et la Promotion de la Nature et de l'Environnement), Un autre regard pour Maincy, AVIE (Association de défense des Victimes de l'Incinération des Déchets), Un autre regard pour Maincy, Association des Médecins de Maincy,* and *ASMSN (Association Seine-et-Marnaise pour la Sauvegarde de la Nature).* Three were 'existing', and two were 'ad-hoc' NGOs. *ASMSN* was created in 1972 by a group of researchers from the *CNRS (Centre National de Recherche Scientifique)*. Its aim is to contribute to the protection of the environment and of the living environment by any means. This NGO, which is affiliated to *France Nature Environnement*, was not initially opposed to the incineration plant project. Incineration was not a matter to them because they considered incineration as a progress by comparison to landfills. In this decision-making process, the NGO was more concerned with the protected site of Vaux-le-Vicomte, where there is a castle. *AIPPNE* was set up in the 1980's. The aim of the NGO is to defend the environment and the town's heritage. *AIPPNE* is in touch with, but not member of, *Coordination du CNIID*, and it is a member of *ASMSN*. The third 'existing' NGO, *Un autre regard pour Maincy*, was set up in 1996 by a group of ten-fifteen residents. The foundors of this NGO wanted to make the functioning of the town hall more democratic. *Un autre regard pour Maincy* is not linked to

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any national NGO net. It engaged against the incineration plant project in 1998, invoking the principle precaution about dioxins. *Association des Médecins de Maincy* is an ad-hoc NGO. It was created in 2000, and gathers together eleven physicians who lived in Maincy. These physicians were worried by the pollution emitted by the existing incineration plant and wondered about the opportunity to set up a new incinerator on the same site, adding pollution again. The aim of the NGO was to bring advices and scientific expertise to the residents, and to warn the public authority about the dangers of household incineration for the population. This NGO was independent. At last, the aims of *AVIE*, an 'ad-hoc' NGO created in 2003, are: to obtain a compensation for the victims of incineration, to prevent the setting up of another incineration plant on the same site, and to obtain a sanitary monitoring of the residents.

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CHRONOLOGICAL TABLE

The chronological tables are the tool I used to gather the data during the interviews with the groupings of *communes*. For each case, there is one table per year. For example for an eight years decision-making process, eight tables are necessary. In the first column, the possible mechanisms of public participation are listed (there is one line for each 'type' of participation initiative). In the first row, time is divided in years (1,2,3,….of the decision-making process). In the second row, the key moment of the decision-making process are noted. This key moment will then define (for the analysis) the significant stages of the decision-making process with regard to public participation. In the other cells (the coordinates of each cell are 'a point in time', and 'a participation mechanism'), the number of actually organised mechanisms, and some specificities about it, is indicated. Moreover, in two cases, the public authorities only accepted to be 'interviewed' via (e-)mail. Consequently, the instructions for the filling of the table have been written down (in French). They can be found below just after the model of the chronological table. The chronological tables of each of the eleven case, resulting from the 15 interviews realised with the public authorities, are available in annexe 3 (entitled 'chronological tables: the eleven decision-making processes')

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Année 1:	**Cas:**											
Mois	Janv.	Fév.	Mars	Avr.	Mai	Juin	Juil.	Aout	Sept.	Oct.	Nov.	Déc.
Dates importantes du projet: voir la liste ci-après												
Information/inclusion du public, des associations, des groupes d'intérêt économique, autre:												
Lettre d'information, journal du syndicat, etc. (nom du journal, date de chaque édition et/ou nombre de numéro sur une période, sujet des articles/des numéros)												
Réunion publiques/colloques Date,lieu et/ou nombre sur une période. Participants (public, élus locaux, associations, groupe d'intérêt économique, ex : chambre d'agriculture, un invité spécial animant la réunion, etc…) Thème(s) de la réunion												
Communiqués de presse (date et/ou nombre sur une période, sujet)												
Autre (ex : courrier aux associations, site web, etc.)												
'Participation' du public/des associations												
Présence passive/Participation active aux réunions de l'entité publique porteuse du projet (nom des associations, des groupes d'intérêt économiques)												
Manifestations lors de réunions de l'entité publique porteuse du projet												
Réunions spécifiques de l'entité publique avec les associations ou groupes d'intérêt économique (dates, et/ou nombre sur une période, sujets abordées). Inclure les CLIS ici.												
Visite de sites existants. Nom des sites, type de traitement, participants, ex. élus locaux, associations, riverains, etc., à défaut nombre)												
Sondage/référendum												
Autre (à préciser)												

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Comment remplir le tableau chronologique ?

Une page par année depuis le tout début du projet jusqu'à l'ouverture de l'U.V.E et la première CLIS qui s'en suit ; ou jusqu'à son abandon définitif, et éventuellement jusqu'à l'ouverture d'une unité de traitement utilisant un autre procédé et la première CLIS qui s'en suit.

1. Les différentes lignes (voir exemple)

Dates importantes du projet
Les 'Dates importantes du projet' ont pour but d'avoir un récit chronologique avec les faits importants qui ont marqué les différentes étapes. La liste des dates ci-dessous est celle des informations minimales que je souhaite avoir et qui sont présentes dans tous les processus de décision. C'est une liste standard, n'hésitez donc pas à ajouter des faits qui vous paraissent importants pour votre projet.
Date importante du processus (s'il y a lieu):

- Création/Nom de l'entité publique porteuse du projet (c.a.d. du syndicat d'étude, Communauté de *Commune*, etc.)
- Transformation en syndicat de réalisation
- Appel d'offre exploitation et construction
- Sélection de l'exploitant
- Sélection du constructeur
- Si possible dépôt demande permis de construire
- dépôt demande autorisation d'exploiter
- Enquête publique
- Si possible Permis de construire accordé
- Autorisation d'exploiter accordée
- Début des travaux
- Ouverture/mise en route officielle de l'unité
- Création de la CLIS
- Abandon du projet d'incinérateur / Démarrage d'un autre projet
- Autre (à préciser)

Autres informations souhaitées :

- Nom du Maitre d'œuvre ou de l'aide Maitre d'œuvre :
- Nom du constructeur :
- Nom de l'exploitant :

Cette première ligne est importante car elle détermine les différents périodes projets et 'structure' les réponses des lignes suivantes.

Pour la précision des dates, le mois me suffit.

Fréquence/nombre des réunions de l'entité publique porteuse du projet :
Selon les phases du projet, la fréquence des réunions a pu changer. Dans chaque case, qui correspond à 1 mois, indiquer par exemple '1 réunion entre les élus du syndicat, sujet : aspect économique' ; ou pour une période indiquer par exemple de février à juin 1999, 1 réunion par

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mois entre les élus du syndicat, sujet : économique et environnemental ; ou encore de février à juin 1999, 5 réunions, sujet : économique et environnemental.

Informations du public, des associations, groupes d'intérêt économique, autre :
Selon les phases, la manière d'informer a pu changer. Là aussi il possible de remplir par mois ou par période.

'Participation' du public/des associations :
Selon les phases, l'éventuelle participation du public a pu changer. Là aussi il possible de remplir par mois ou par période.

2. Note générale sur le remplissage

Quand il n'y a pas d'évènement pour un mois ou une période, laisser les cases blanches.
Si une ligne est sans objet pour votre cas durant toute la période du projet, écrire « sans objet » dans la case du premier mois de la première année
Si vous n'avez pas le mois précis, indiquer la période approximative la plus restreinte possible. Par exemple, 'entre décembre 1998 et janvier 1999, dépôt de la demande d'autorisation à exploiter.
Enfin, sentez-vous libre d'ajouter d'autres informations qui vous semblent importante (ex. projet en vue de remplacement d'un incinérateur ne répondant pas aux nouvelles normes).
Sentez-vous libre d'ajouter des informations en marge du tableau.

3. Note technique sur le remplissage ; à propos de Word:

Pour une remplir les cases pour une période donnée, vous avez (au moins) trois possibilités. De la plus simple à la plus compliquée :

1. Dans la case correspondant au premier mois de la période écrire, par exemple, du mois de février au mois de juin …
2. Fusionner les cellules : sélectionner les mois de la période. Cliquer bouton droit de la souris. Sélectionner 'fusionner les cellule'. Puis écrire, par exemple, du mois de février au mois de juin …
3. Faire apparaître la barre d'outils 'dessin' et utiliser les 'cadres textes'. Puis écrire, par exemple, du mois de février au mois de juin …

Le problème est que le 'cadre texte' n'est pas 'attaché' au tableau. A la fin du remplissage, il est possible qu'un cadre texte que vous avez disposé ne soit plus sur la bonne ligne, il faut alors le repositionner.

Dans tous les cas, ne vous préoccupez pas pour la mise en forme, l'important est que les informations soient présentes.
Si vous préférez, vous pouvez me fournir les informations sur un papier libre, sans remplir le tableau.

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QUESTIONNAIRE FOR THE NGOS

Association

1. Quelle est la date de création de votre association ?

2. Pour quelles raisons a-t-elle été créée, quel était son but initial ?

3. Etes vous affilié à une association nationale et/ou internationale ?

4. Si, oui la ou lesquelles ?

5. voir ci-dessous

6. Quelle est votre position vis-à-vis de l'incinérateur.
   Quelle est la date d'engagement de l'association. Pour quelles raisons vous êtes vous mobilisés autour de ce projet d'incinérateur?

7. Y a t il des évènements passés qui ont contribué à votre mobilisation ?
   Le cas de Gilly-sur-Isère a-t-il été un évènement important pour votre mobilisation ?

Information et participation éventuelle du public dans le processus de décision

5. Comment l'entité publique porteuse du projet a-t-elle informé et éventuellement inclus le public et plus particulièrement votre association ? (types d'action, dates)

8. Par conséquent, quels ont été vos modes d'actions ? (types d'action, dates)

~~9. Etes-vous satisfait de la manière dont l'entité publique porteuse du projet vous a informé ou inclus dans le processus de décision?~~

~~10. Qualifieriez-vous vos relations avec l'entité publique porteuse du projet de consensuelles, constructives, controversés, conflictuelles, autre ?~~

10bis. Quelle est la composition de la CLIS ?

Mobilisation de la connaissance technique et scientifique

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11. Avez-vous mobilisé par vous-même ou demandé à NOM DE L'AUTHORITE PUBLIQUE des expertises scientifiques sur le lien incinération-santé ? (expertise faites faire par vous-mêmes ou pré-existante, concernant d'autres cas d'incinérateur)
    Si non : pour quelles raisons ?
    Si oui : Quelles ont été vos sources ? (ou nom des laboratoires/confiance?)

12. Avez-vous mobilisé par vous même ou demandé à NOM DE L'AUTHORITE PUBLIQUE des expertises scientifiques sur le lien incinération-environnement ? (expertise faites faire par vous-mêmes ou pré-existante, concernant d'autres cas d'incinérateur)
    Si non : pour quelles raisons ?
    Si oui : Quelles ont été vos sources ? (ou nom des laboratoires/confiance?)

13. Avez-vous mobilisé ou demandé à NOM DE L'AUTHORITE PUBLIQUE des expertises scientifiques concernant la mesure des émissions de molécules polluantes ?
    Si non : pour quelles raisons ?
    Si oui : Quelles ont été vos sources ? (ou nom des laboratoires/confiance?)

14. Avez-vous mobilisé des connaissances techniques concernant l'incinération ou des alternatives techniques pour le traitement des déchets ?
    Si non : pour quelles raisons ?
    Si oui : Quelles ont été vos sources ? (ou nom des laboratoires/confiance?)

~~15. L'entité publique porteuse du projet a-t-elle apporté des expertises sur le lien incinératin-santé ?~~

~~(Si oui) Qu'en pensez-vous ?~~

~~15bis. L'entité publique porteuse du projet a-t-elle apporté des expertises sur le lien incinératin-santé ?~~

~~(Si oui) Qu'en pensez-vous ?~~

16. Avez-vous confiance dans les mesures concernant les mesures d'émission de molécules polluantes faites par l'entité publique porteuse du projet ou l'exploitant?

~~17. Que pensez-vous de l'expertise technique apportée par l'entité publique porteuse du projet concernant les alternatives à l'incinération pour le traitement des déchets?~~

~~Pensez-vous que concernant la technologie concernant l'incinération l'entité publique porteuse du projet à utilisé la meilleur technologie existante ?~~

Autre

18. Quelles sont les autres associations qui se sont mobilisées ?
    Auriez-vous les coordonnées d'autres personnes pouvant répondre à mes questions ?

19. Seriez-vous près à me faire parvenir des documents que vous avez édités et à répondre à d'éventuelles questions ultérieures ?

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TEMPLATE OF THETABLE OF THE NUMBER OF EACH TYPE OF MECHANISMS IN EACH KEY CHRONOLOGICAL STAGE

For each case, a table has been filled, counting the number of iniatives sponsored in each stage. This table is a combination of the typology of the mechanisms with the three chronological stages (see below).

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Case:		**Stages**	***'Framing'***	**'*Specifications*'**	***'realisation'***	**After Opening**	**Total**
		Sub-stages (possibly)					
		Dates					
Mechanism Classes[229]		**Mechanisms present in this research**[230]					
Top-down Communication	Top-down communication type 1* (traditional publicity)	Information broadcasts ('Publicity' via newsletters/ Journal, press releases, radio broadcasts, letters to associations)					
	Top-down communication type 2*	Public Meeting (Eventually with question-and-answer session) District councils					
	Top-down communication type 3*	Public authority (non interactive) web site Exhibition					
	Top-down communication type 5	Formal / Informal Meetings with NGOs or groups of economical interests Visits of existing facilities with NGOs or groups of economical interests Compulsory Local commission for information and monitoring					
	Top-down communication type 6	Phone Communication with NGOs or groups of economical interests					
	Total						

[229] NOTE: asterisks (*) mark the top-down types that have been initially listed in the typology set up by Rowe G. and Frewer L.J. 2005.
[230] The term "association" refers to NGOs, groups of interests, or other organizations.

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Case:		Stages	*'Framing'*	'*Specifications*'	*'realisation'*	After Opening	Total
		Sub-stages (possibly)					
		Dates					
Mechanism Classes[229]		**Mechanisms present in this research**[230]					
Top-down Consultation	Top-down consultation type 1*	Opinion Survey Local referenda					
	Top-down consultation type 2*	Consultative Committee					
	Top-down consultation type 4	Consultation meeting with representatives of associations					
	Top-down consultation type 5	Consultation public meeting					
	Total						
Top-down Participation	Top-down participation type 1*	Action Planning Workshop *(commission départementale pour le plan d'élimination des déchets des ordures ménagères)*[231]					
	Top-down participation type 3	Non compulsory and Compulsory Local commission for information and monitoring					
	Top-down participation type 4	Registre d'enquête (Enquiry Register) (Compulsory Public Enquiry)					
	Top-down participation type 5	*Interview with commissaires enquêteurs* (compulsory public enquiry)					
	Total						
No Engagement	No Mechanism	No Initiative					

[231] *Départemental* commission for the disposal of household and similar waste plan

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Case:		**Stages**	***'Framing'***	**'*Specifications*'**	***'realisation'***	**After Opening**	**Total**
		Sub-stages (possibly)					
		Dates					
Mechanism Classes[229]		**Mechanisms present in this research**[230]					
Bottom-up Consultation	Bottom-up consultation type 1	Association meeting with policy-makers					
	Bottom-up consultation type 2	Request of Documents					
	Total						
Bottom-up Communication	Bottom-up communication type 1 (traditional public protest)	Demonstration Petition Protest letter sent to policy-makers					
	Bottom-up communication type 2	Opposition association press release Opposition Open Letters					
	Bottom-up communication type 3	Association Information broadcast ('Publicity' via newsletters/ Journal, newspaper, open Letters, press release, radio broadcast)					
	Bottom-up communication type 4	Association exhibition Association web site					
	Bottom-up communication type 5	Association conferences Association public meeting					
	Bottom-up communication type 6	Association newsletter, reports, or expertises, sent to policy-makers					
	Total						

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Case:		**Stages**	***'Framing'***	**'*Specifications*'**	***'realisation'***	**After Opening**	**Total**
		Sub-stages (possibly)					
		Dates					
Mechanism Classes[229]		**Mechanisms present in this research**[230]					
Bottom-up Participation	Bottom-up participation type 1	Not present in this research. For information, existing exercices: Community based research Patient association					
	Total						

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PUBLIC ENGAGEMENT MECHANISMS CLASSIFIED ACCORDING TO THE STATE OF THEIR EIGHT SIGNIFICANT CHARACTERISTICS

Table 25 below lists the mechanisms sponsored by the public authority and by the public in the ten decision-making processes and states their structural variability, so that each mechanism is fully defined through the values of its eight significant characteristics. The class of the mechanisms (top-down communication, top-down consultation, etc.) is also indicated. However, this table is not the typology itself, but a working document.

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Table 24: Public engagement mechanisms classified according to the values of their eight key characteristics

Engagement Class	Type of Mechanism[232]	Characteristics[233]							
		Selection Method: Controlled-Uncontrolled	Elicitation Facilitation: Yes-No	Response Mode: Open-Closed	Information Input: Set-Flexible	Medium of information transfer: FTF-Non FTF	Facilitation of aggregation: Structured-Unstructured	Addressee of information: Public authority-Larger public	Argument: Yes-No
Top-down Communication	Information broadcasts ('Publicity via newsletters/ Journal, press releases, radio broadcasts, letters to associations)	Controlled	NA	NA	Set	Non FTF	NA	NA	NA
	District councils (compulsory for big municipalities)	Uncontrolled	NA	NA	Flexible	FTF	NA	NA	NA
	Public Meeting (Eventually with question-and-answer session)	Uncontrolled	NA	NA	Flexible	FTF	NA	NA	NA
	Public authority web site	Uncontrolled	NA	NA	Set	Non FTF	NA	NA	NA
	Public authority exhibition	Uncontrolled	NA	NA	Set	Non FTF	NA	NA	NA
	Formal / Informal Meetings with representatives of associations	Controlled	NA	NA	Flexible	FTF	NA	NA	NA
	Visits of existing facilities with associations	Controlled	NA	NA	Flexible	FTF	NA	NA	NA
	Compulsory Local Committee for Information and Monitoring	Controlled	NA	NA	Flexible	FTF	NA	NA	NA
	Phone Communication with associations	Controlled	NA	NA	Flexible	Non FTF	NA	NA	NA

[232] Associations is a generic term which indifferently names NGOs, groups of interests, or other organizations.
[233] NOTE : FTF = Face-To-Face ; NA = Non Answer, where the key charateristic is not relevant for the type of engagement

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Engagement Class	Type of Mechanism[232]	Characteristics[233]							
		Selection Method: Controlled-Uncontrolled	Elicitation Facilitation: Yes-No	Response Mode: Open-Closed	Information Input: Set-Flexible	Medium of information transfer: FTF-Non FTF	Facilitation of aggregation: Structured-Unstructured	Addressee of information: Public authority-Larger public	Argument: Yes-No
Top-down Consultation	Opinion Survey	Controlled	No	Closed	NA	Non FTF	Structured	NA	NA
	Local referenda	Controlled	No	Closed	NA	Non FTF	Structured	NA	NA
	Consultative Committee	Controlled	No	Open	NA	Non FTF	Unstructured	NA	NA
	Local public services consultative commission (compulsory)	Controlled	No	Open	NA	Non FTF	Unstructured	NA	
	Consultation meeting with representatives of associations	Controlled	No	Open	NA	Non FTF	Unstructured	NA	NA
	Consultation public meeting	Uncontrolled	No	Open	NA	FTF	Unstructured	NA	NA
Top-down Participation	Action Planning Workshop *(Départemental commission for the disposal of household and similar waste plan)*	Controlled	Yes	Open	Flexible	FTF	Unstructured	NA	NA
	Non compulsory and (sometimes) compulsory Local commission for information and monitoring	Controlled	No	Open	Flexible	FTF	Unstructured	NA	NA
	Registre d'enquête (Enquiry Register) (Compulsory Public Enquiry)	Uncontrolled	Yes	Open	Set	Non FTF	Unstructured	NA	NA
	Interview with *commissaires enquêteurs* (compulsory public enquiry)	Uncontrolled	Yes	Open	Set	FTF	Unstructured	NA	NA
No Engagement	No Mechanism	NA	NA	NA	NA	NA	NA	NA	NA
	Legal actions	NA	NA	NA	NA	NA	NA	NA	NA

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Engagement Class	Type of Mechanism[232]	Characteristics[233]							
		Selection Method: Controlled-Uncontrolled	Elicitation Facilitation: Yes-No	Response Mode: Open-Closed	Information Input: Set-Flexible	Medium of information transfer: FTF-Non FTF	Facilitation of aggregation: Structured-Unstructured	Addressee of information: Public authority-Larger public	Argument: Yes-No
Bottom-up Consultation	Association meeting with policy-makers	NA	No	Open	NA	FTF	Unstructured	NA	NA
	Request of Documents	NA	No	Open	NA	Non FTF	Unstructured	NA	NA
Bottom-up Communication	Demonstration	Controlled	NA	NA	Set	FTF	NA	Public authority	No
	Petition	Controlled	NA	NA	Set	FTF	NA	Public authority	No
	Protest letter sent to policy-makers	Controlled	NA	NA	Set	FTF	NA	Public authority	No
	Association press release	Controlled	NA	NA	Set	Non FTF	NA	Larger Public	Yes
	Open Letters to policy-makers	Controlled	NA	NA	Set	Non FTF	NA	Larger Public	No
	Association information broadcast ('Publicity' via newsletters/ Journal, newspaper)	Controlled	NA	NA	Set	Non FTF	NA	Larger Public	Yes
	Association exhibition	Uncontrolled	NA	NA	Set	Non FTF	NA	Larger Public	Yes
	Association web site	Uncontrolled	NA	NA	Set	Non FTF	NA	Larger Public	Yes
	Association public meeting	Uncontrolled	NA	NA	Flexible	FTF	NA	Larger Public	Yes
	Association conferences	Uncontrolled	NA	NA	Flexible	FTF	NA	Larger Public	Yes
	Association newsletter, reports, or expertises, sent to policy-makers	Controlled	NA	NA	Set	Non FTF	NA	Public authority	Yes
Bottom-up Participation	Not present in this research. For illustration, some mechanisms listed by Rowe and Frewer:								
	Community based research	Controlled	Yes	Open	Flexible	FTF	Unstructured	Public authority	Yes
	Patient association	Controlled	Yes	Open	Flexible	FTF	Unstructured	Public authority	Yes

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ACTUAL PUBLIC ENGAGEMENT: CHARTS BY CLASS OF MECHANISMS

This appendix contains the charts of chronological study of the public engagement along the decision-making processes. There is one chart for each of the seven types of public engagement mechanisms: top-down communication, top-down consultation, top-down participation, legal actions (no engagement), bottom-up communication, bottom-up consultation, and bottom-up participation. The Y-axis represents the number of initiatives while the X-axis is made of the three key stages of the decision-making processes ('*framing*', '*specifications*', and *'realisation'*). There are ten curves on each chart: one for each decision-making process. At last, the tables situated under the charts are the data tables: the numbers are the numbers of initiatives.

The three cases (1. *Gueugnon*, 2. *Angers*, 3. *Thiviers*) in which the incineration plant project were finally given up ended during the second stage. Consequently, there is no third stage for these three cases. Moreover, there is no curve for the case 7. *Nîmes* since it has been finally removed from the research due to a lack of data.

In order to draw these charts, it has been necessary to set up first the tables of the relative data. These tables combine the typology of the public engagement mechanisms and the three key chronological stages. For each of the 10 decision-making processes, a first table is set up: in the two first columns are indicated the class and the type of the mechanisms while the key chronological stages are in the first row. In each cell, that is, for each type of mechanism and for each chronological stage, the number of initiatives actually organised has been counted. I have not included these tables in the dissertation; but I have included a second kind of table, more synthetic. This second kind of table is composed of the seven classes of mechanisms

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and of the three chronological stages. In each cell, that is, for each class of mechanisms and for each stage, the number of initiatives actually organised is indicated. The synthetic tables can be found under each chart, respectively.

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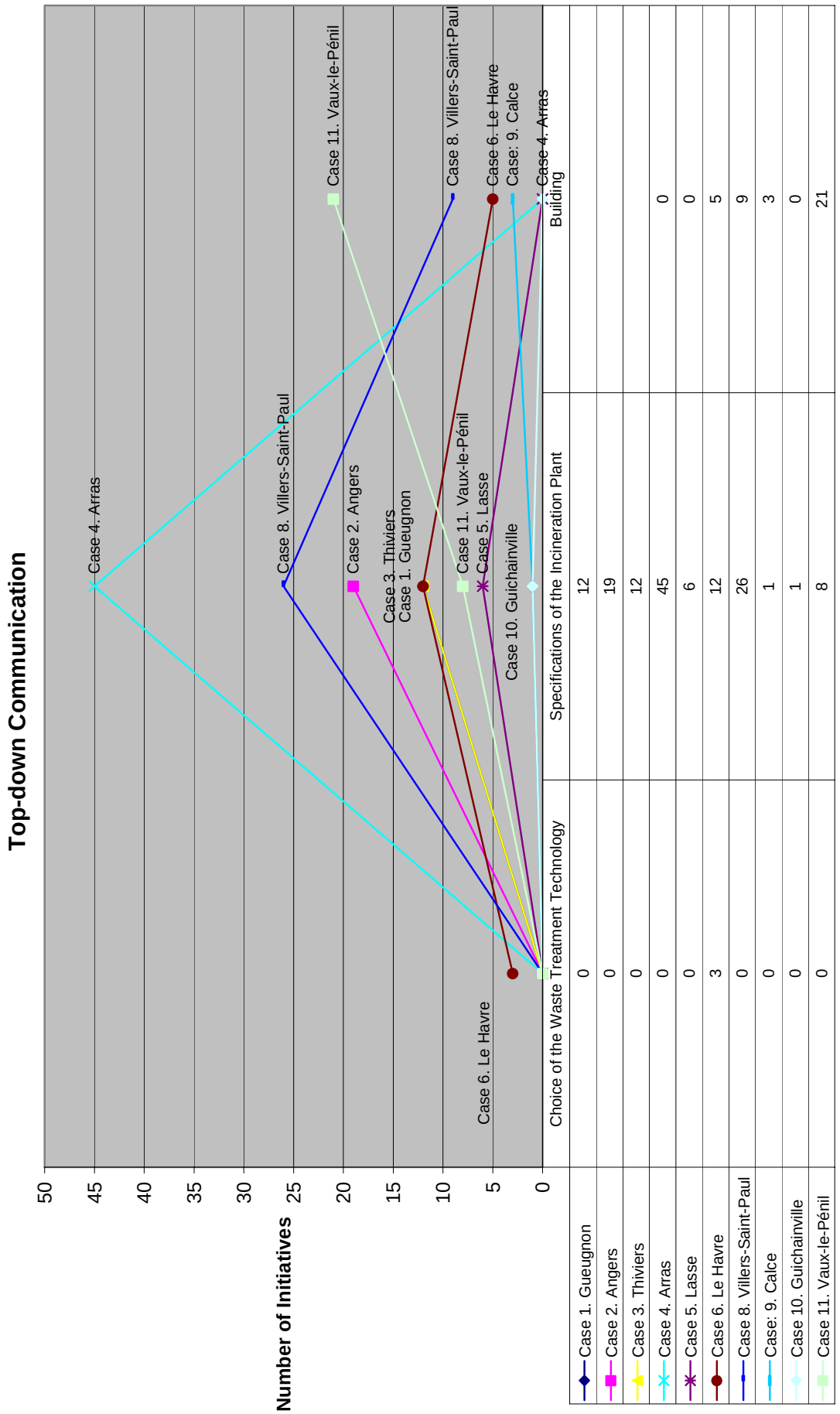

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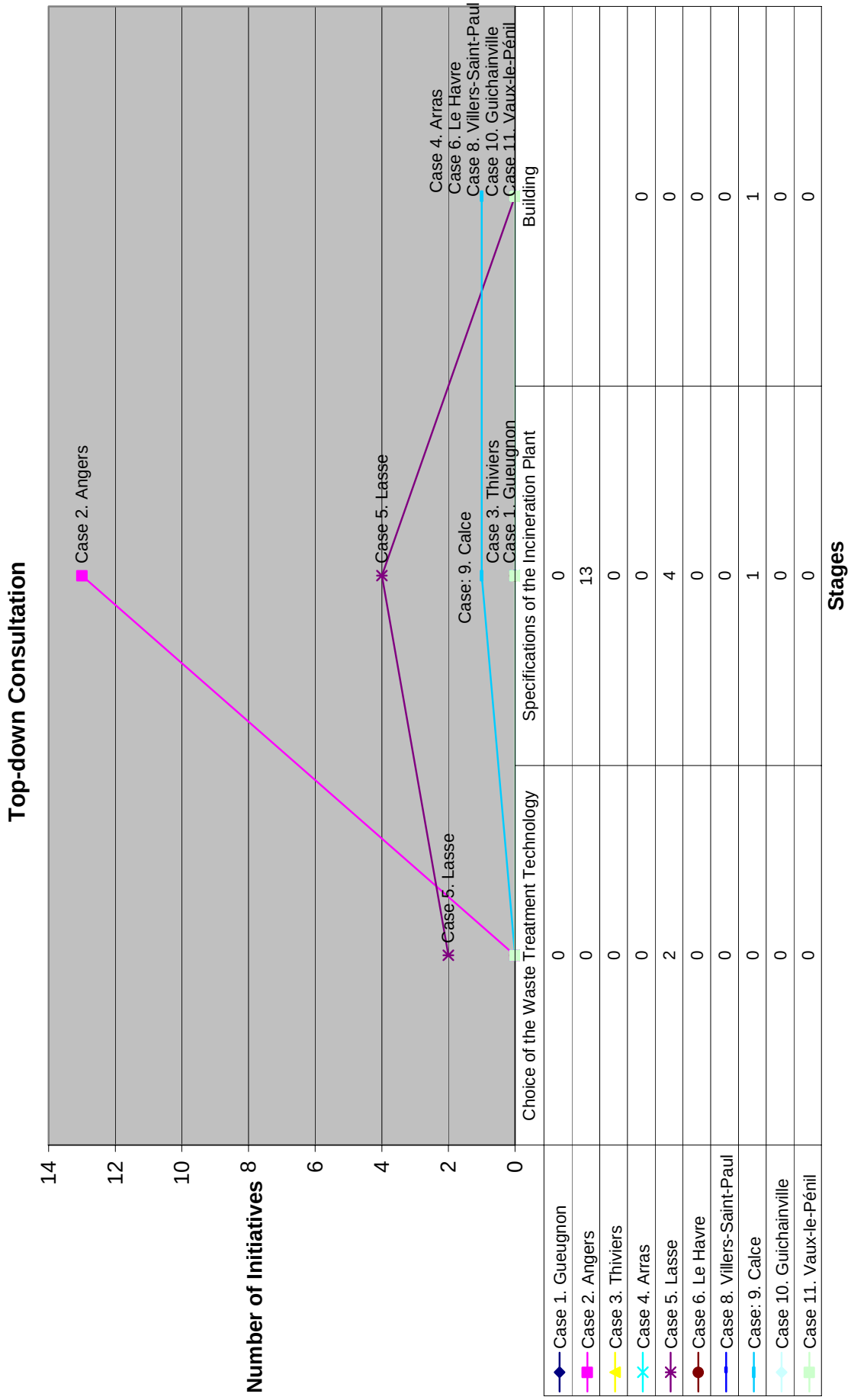

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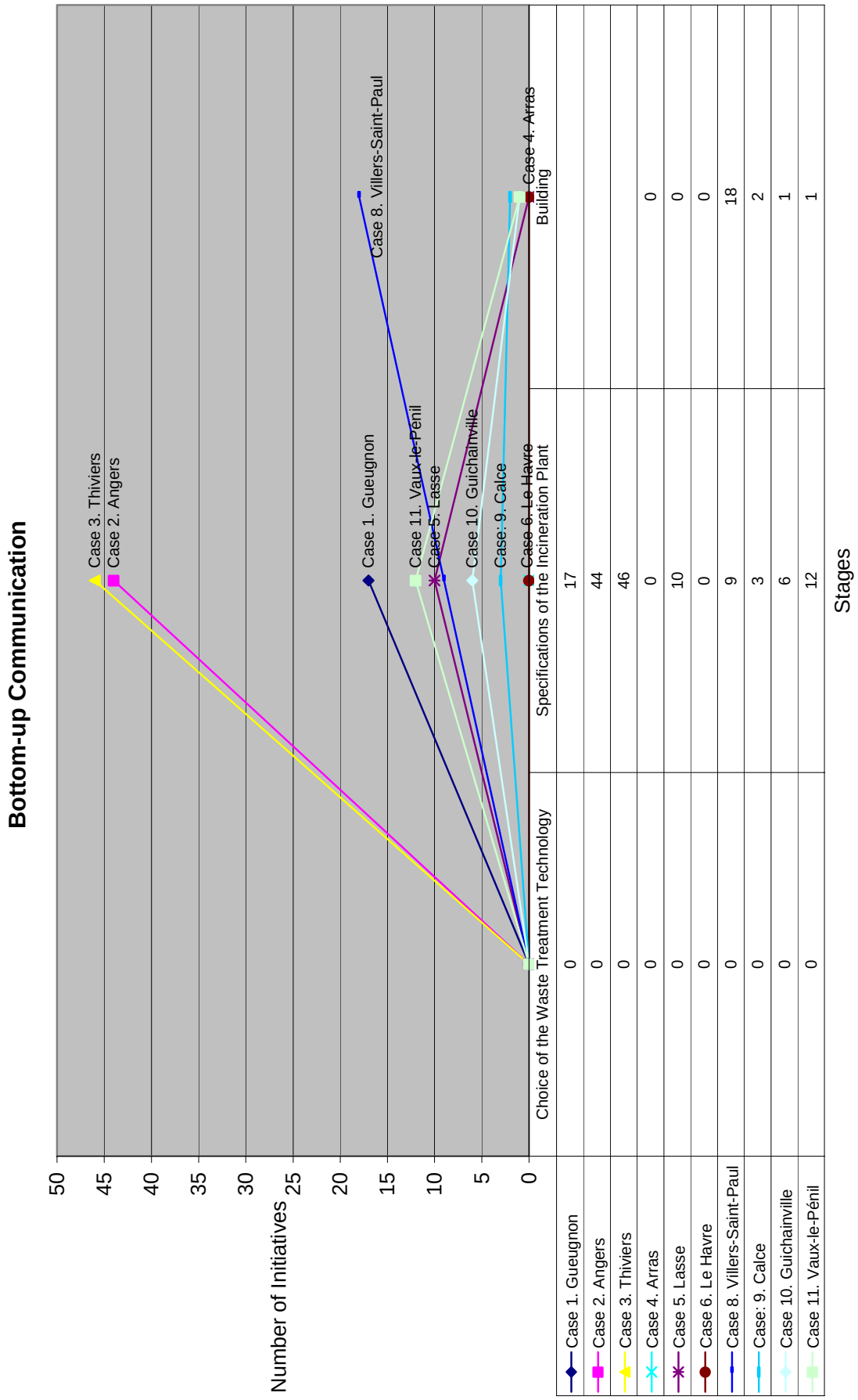

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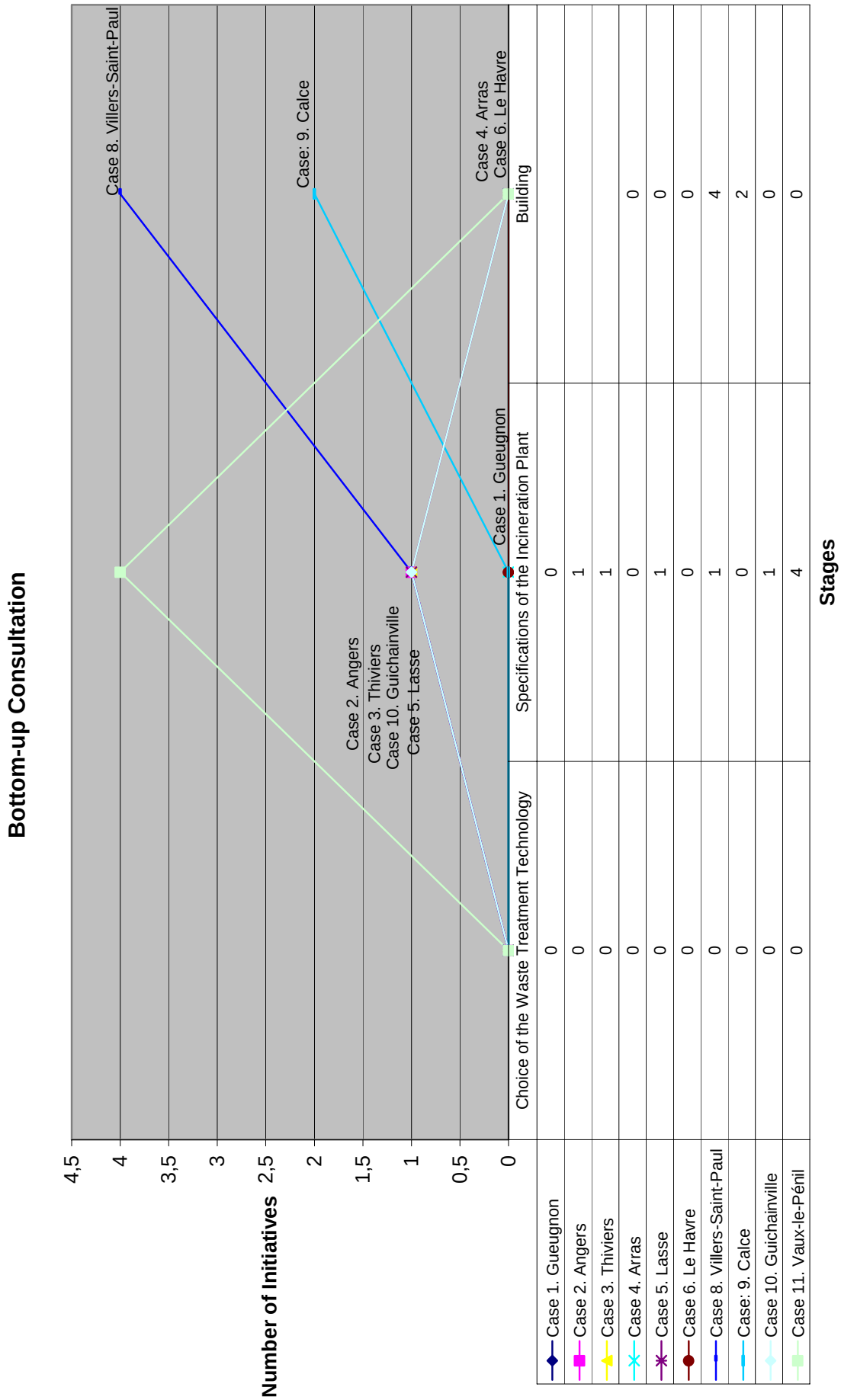

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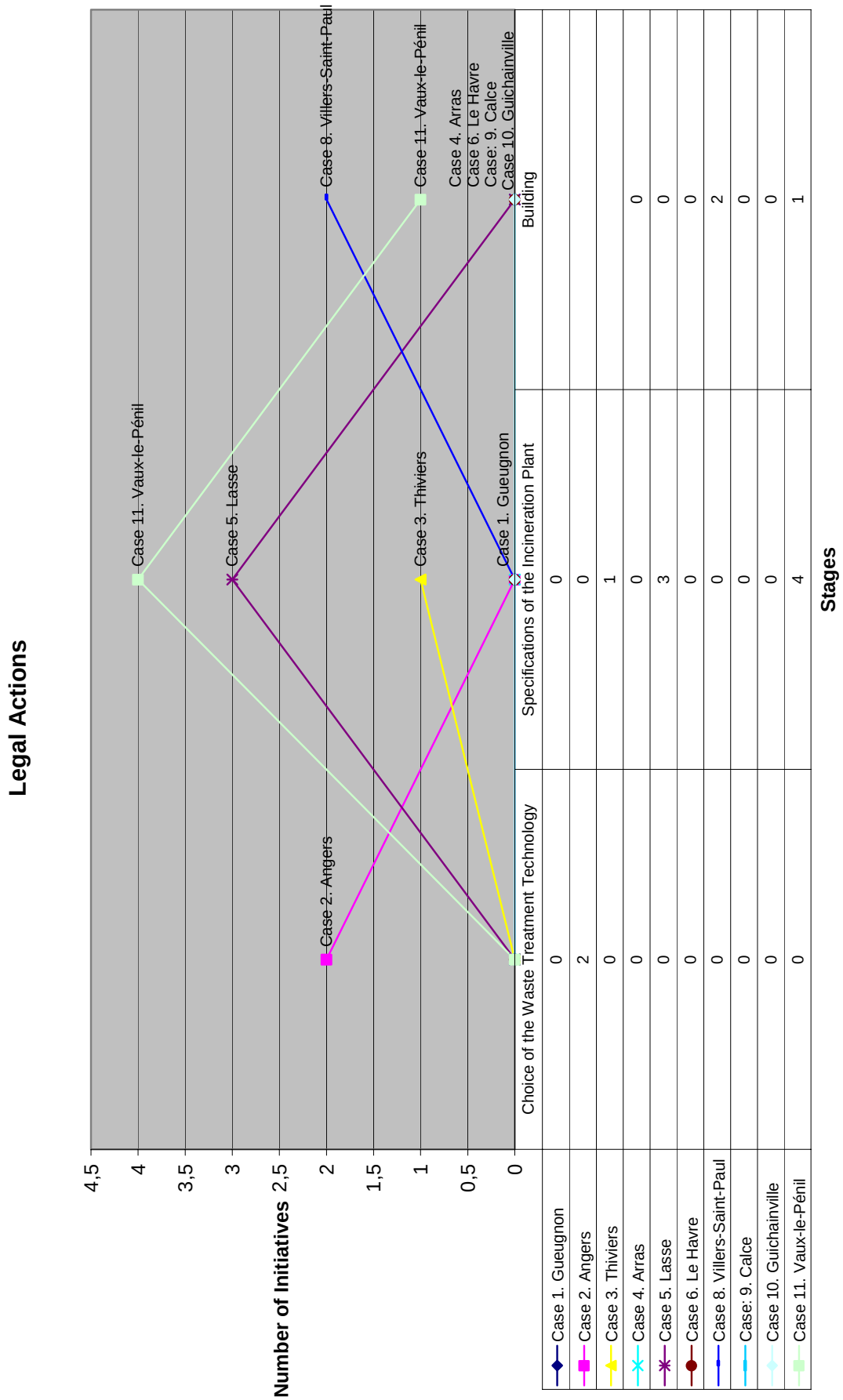

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ACTUAL PUBLIC ENGAGEMENT: CHARTS BY DECISION-MAKING PROCESS

This appendix contains the charts of the chronological study of the public engagement along the decision-making processes. There is one chart for each of the 10 cases. The Y-axis represents the number of initiatives while the X-axis is made of the three key stages of the decision-making processes ('*framing*', '*specifications*', and *'realisation'*). On each chart, there is one curve for each of the seven types of public engagement mechanisms (top-down communication, top-down consultation, top-down participation, legal actions [no engagement], bottom-up communication, bottom-up consultation, and bottom-up participation). The tables situated under the charts are the data tables: the numbers are the numbers of initiatives.

The three cases (1. *Gueugnon*, 2. *Angers*, 3. *Thiviers*) in which the incineration plant project has finally been given up ended during the second stage. Thus, there is no third stage for these three cases. Moreover, there is no chart for the case 7. *Nîmes* since it has been finally removed from the research due to a lack of data.

In order to draw these charts, it has been necessary to set up first the tables of the relative data. These tables combine the typology of the public engagement mechanisms and the three key chronological stages. For each of the ten decision-making processes, a first table is set up: in the two first columns are indicated the class and the type of the mechanisms while the key chronological stages are in the first row. In each cell, that is, for each type of mechanism and for each chronological stage, the number of initiatives actually organised has been counted. I have not included these tables in the dissertation; but I have included a second kind of table, more synthetic. This second kind of table is composed of the seven classes of mechanisms

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and of the three chronological stages. In each cell, that is, for each class of mechanisms and for each stage, the number of initiatives actually organised is indicated. The synthetic tables can be found under each chart, respectively.

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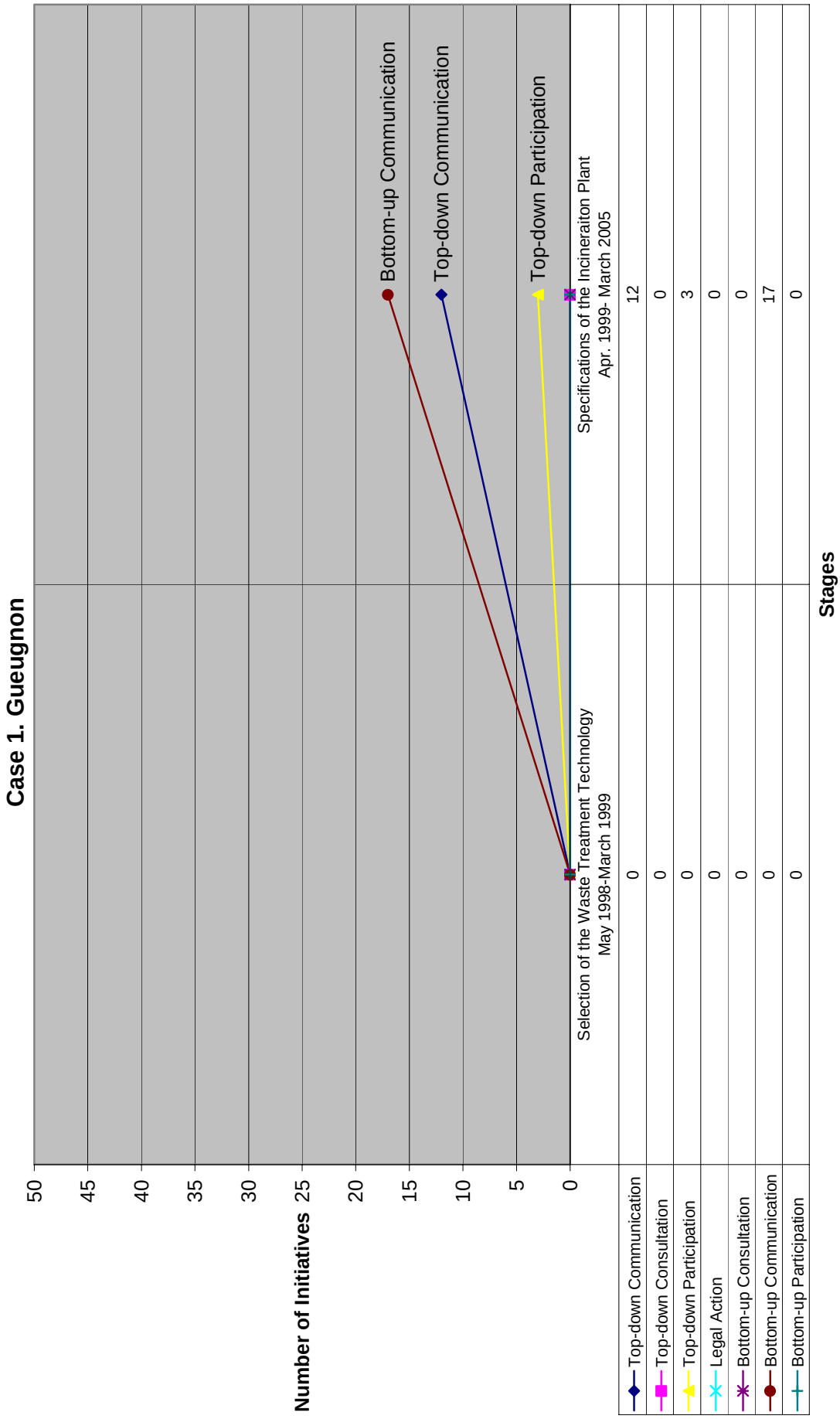

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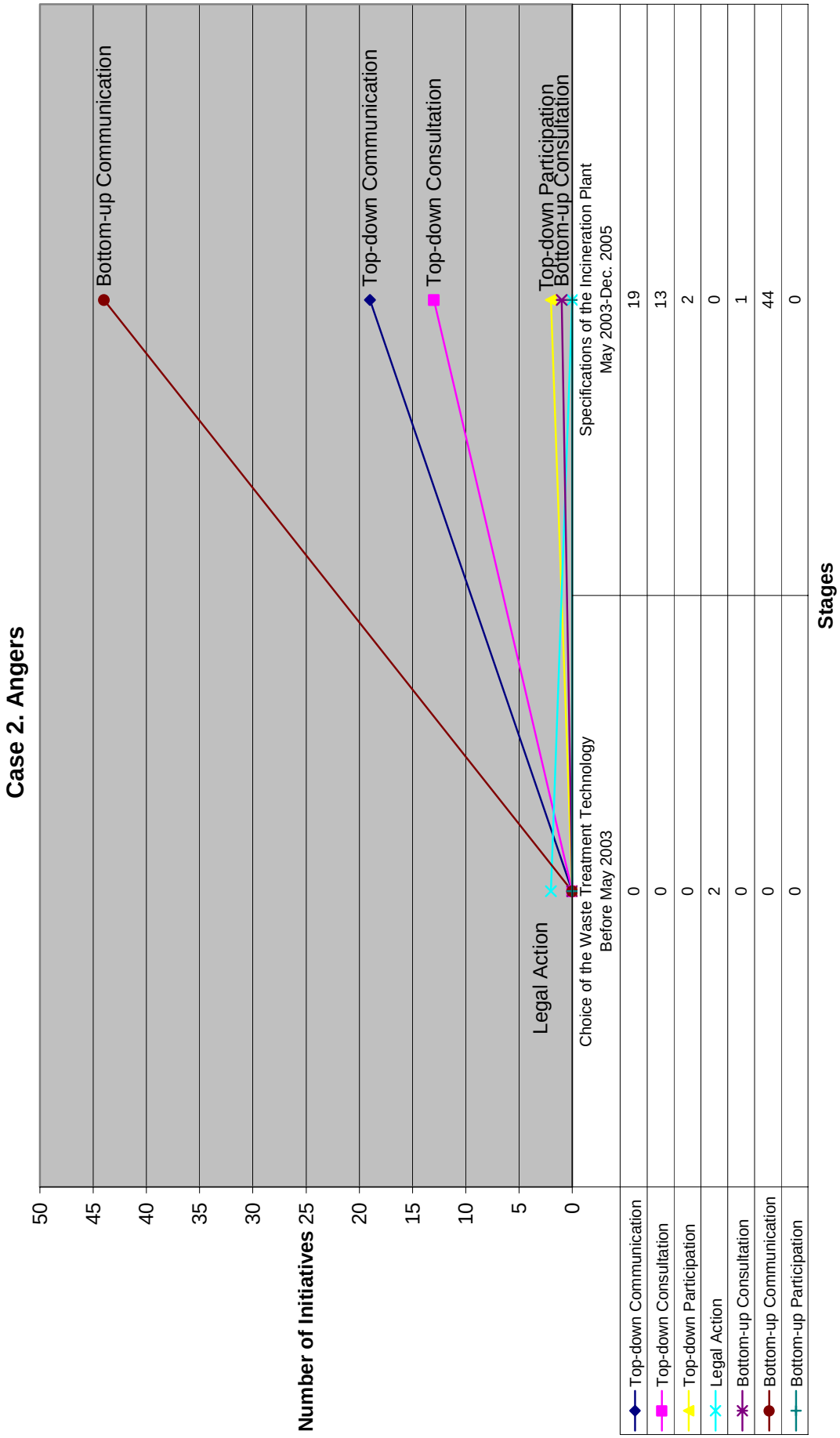

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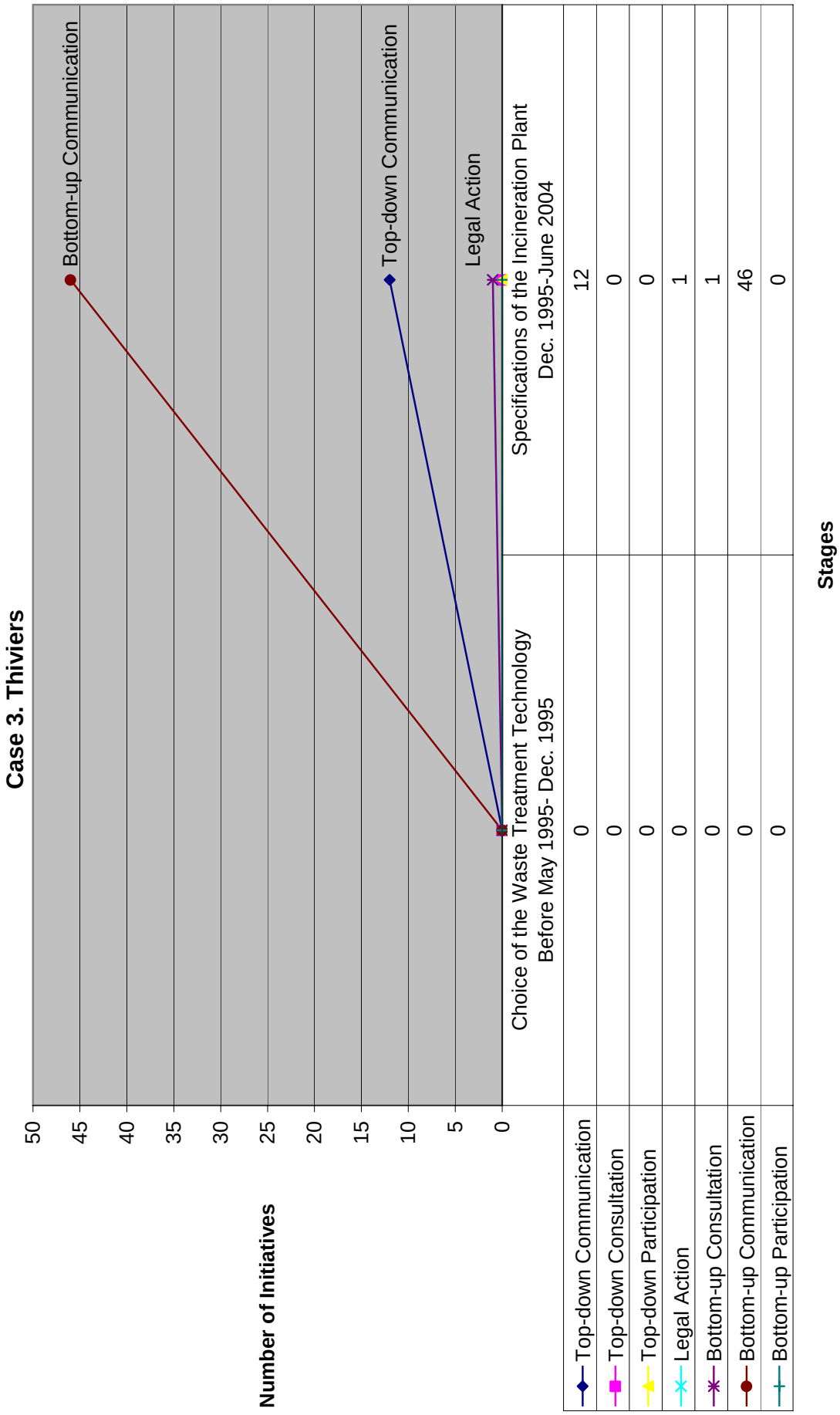

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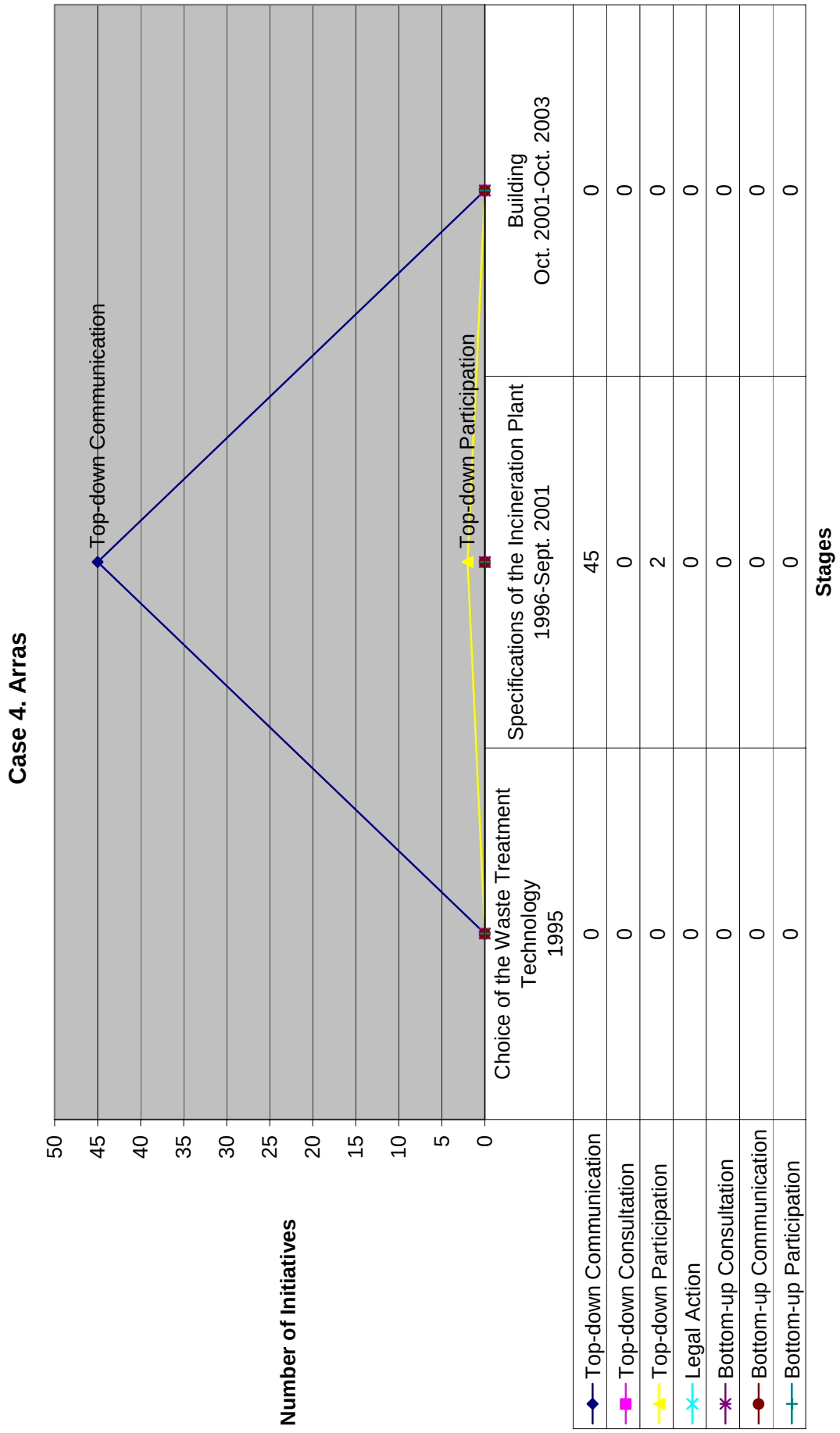

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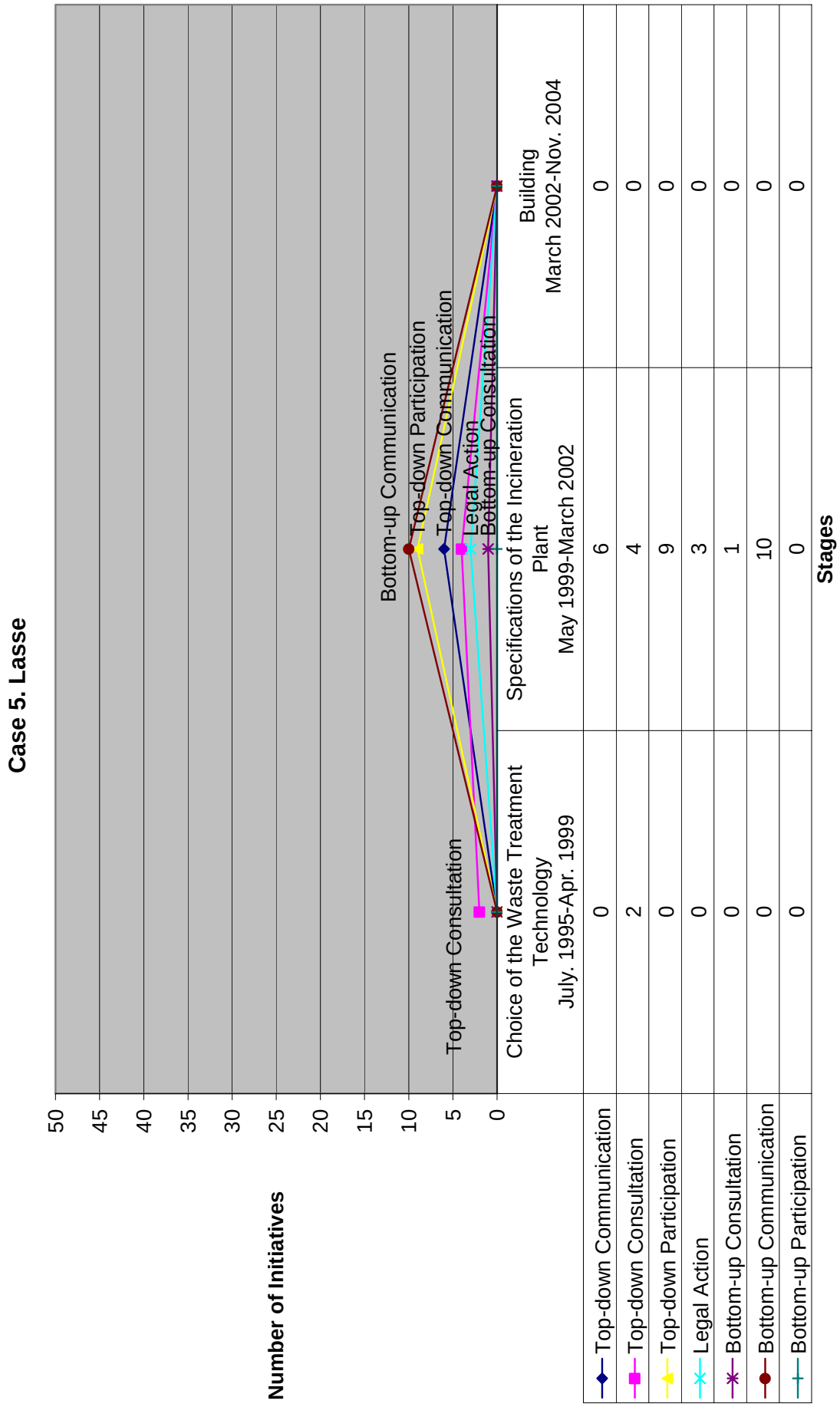

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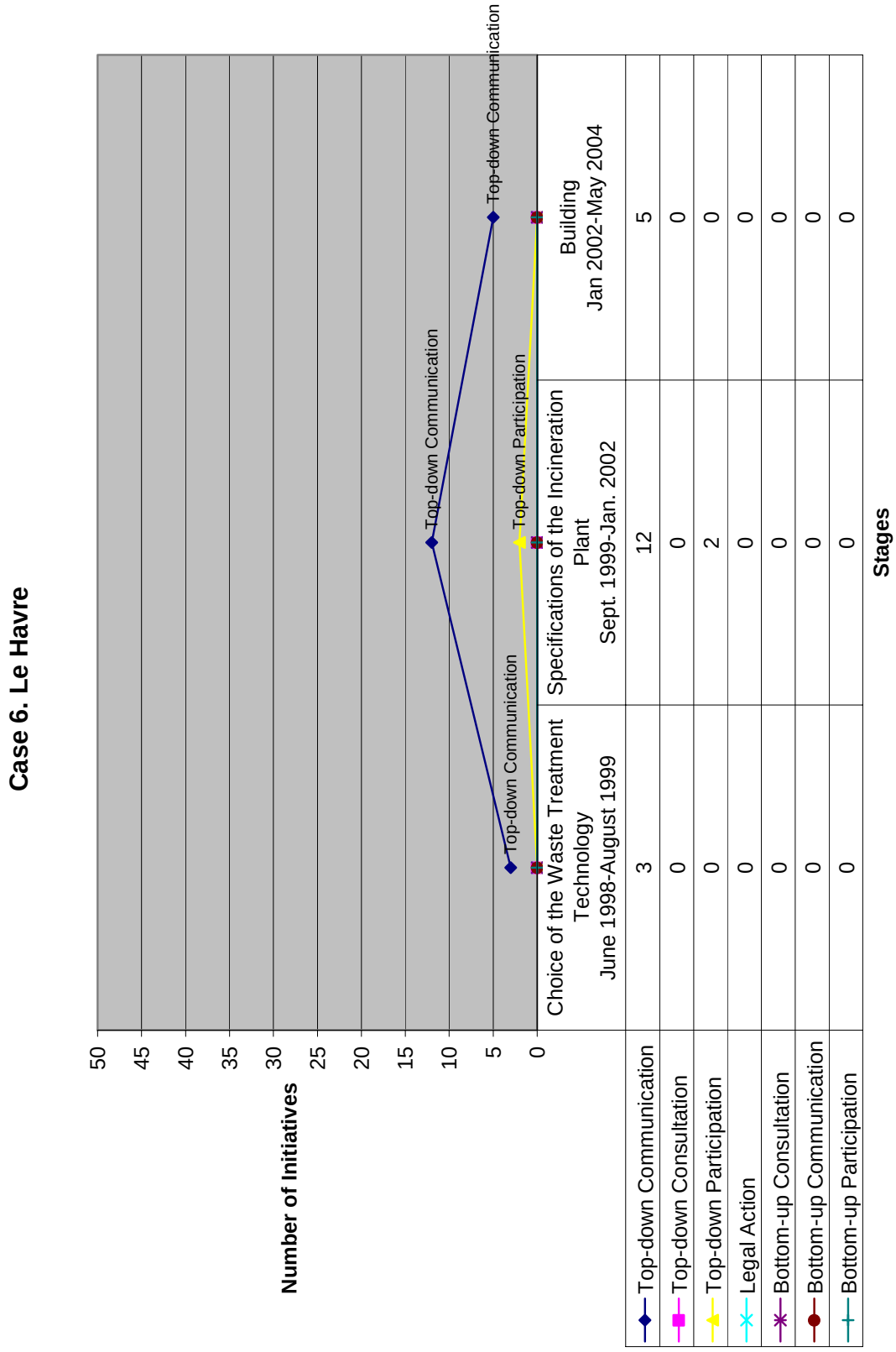

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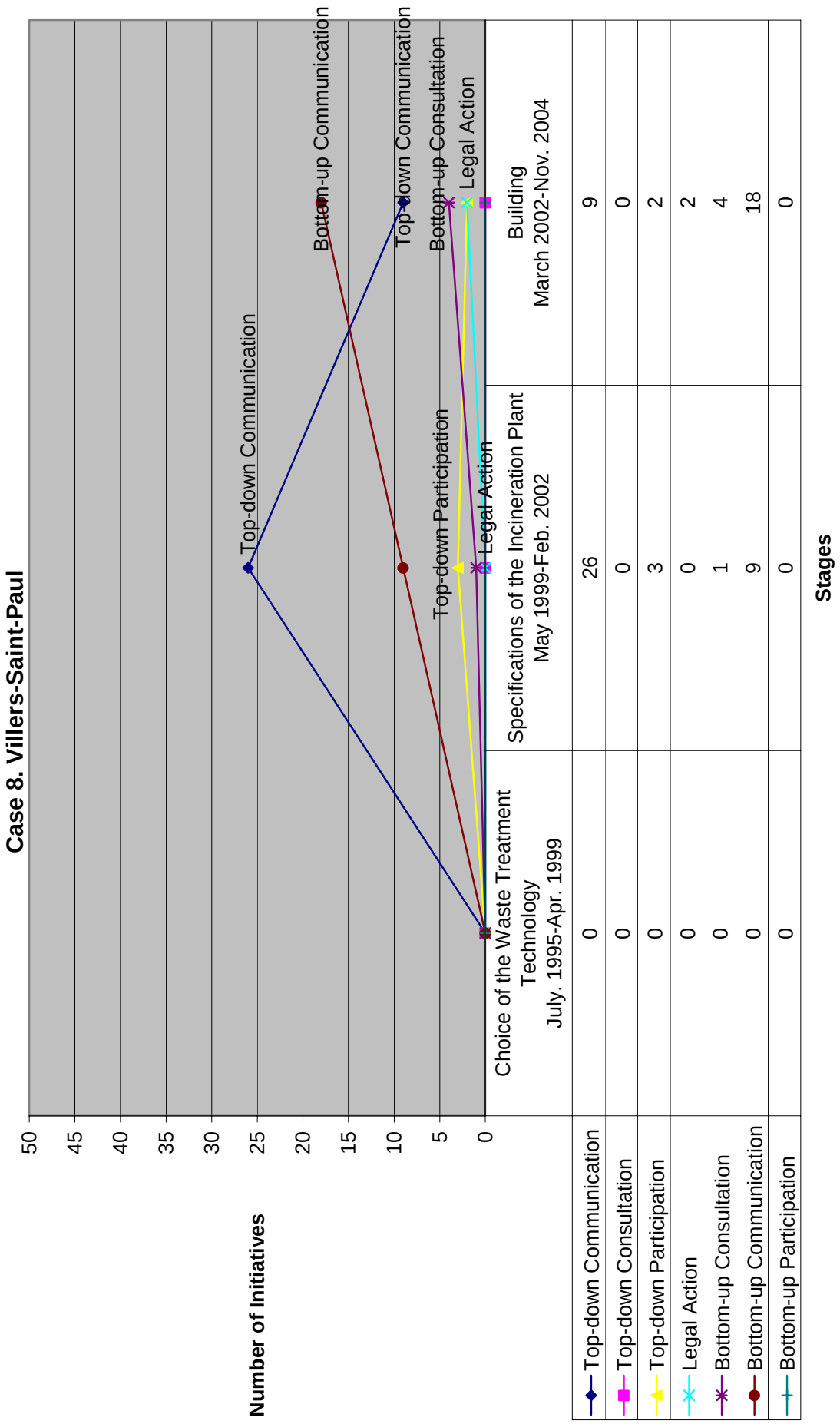

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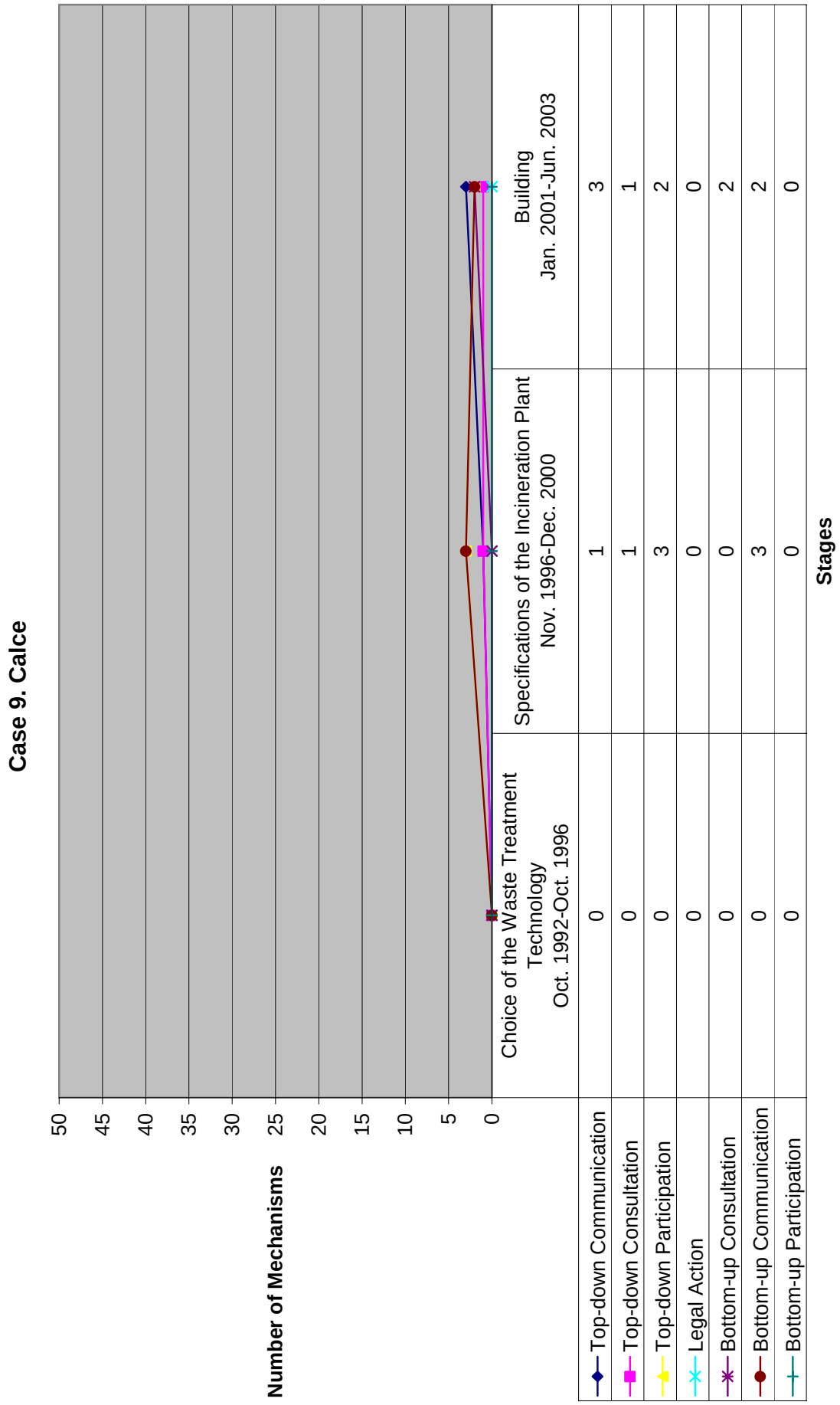

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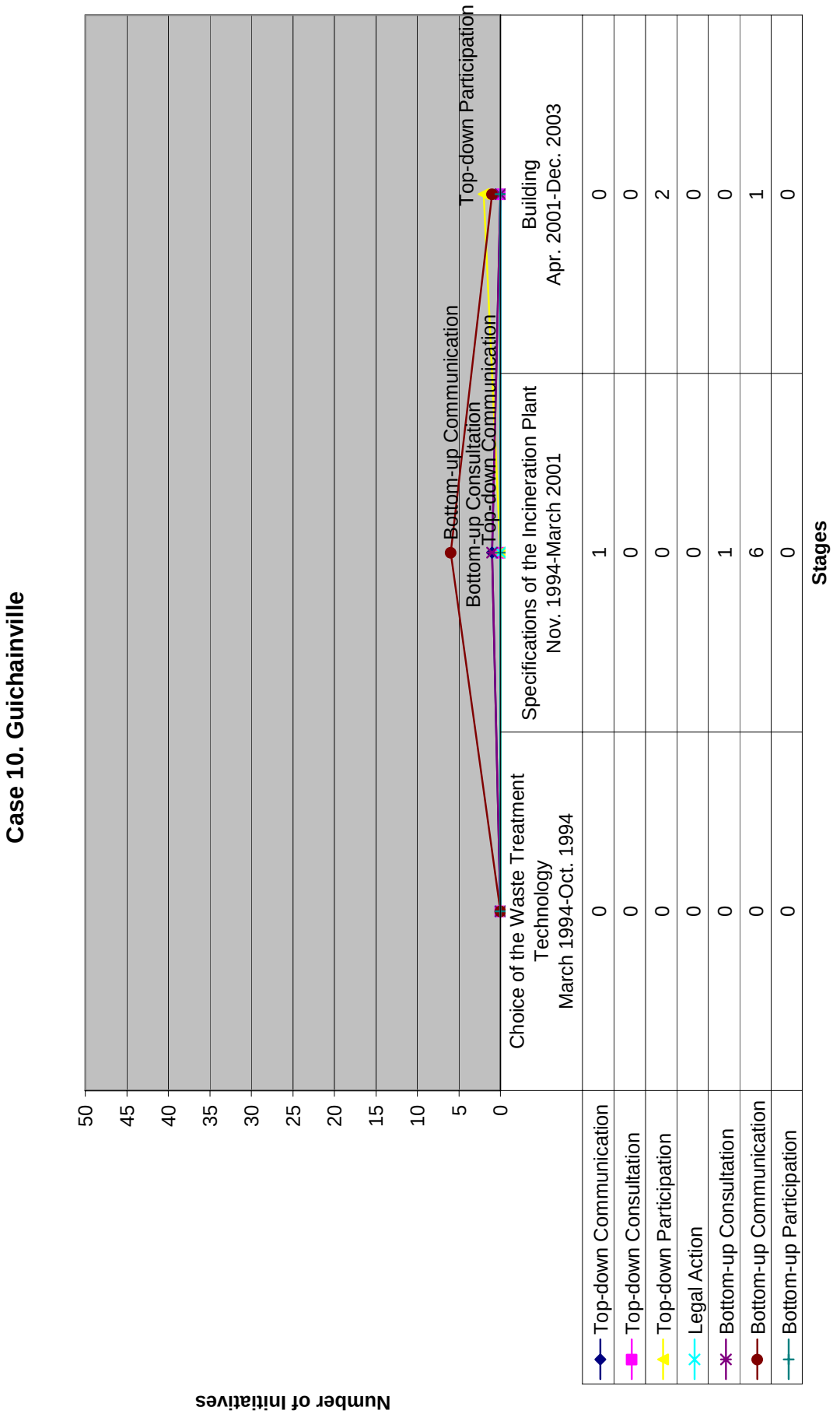

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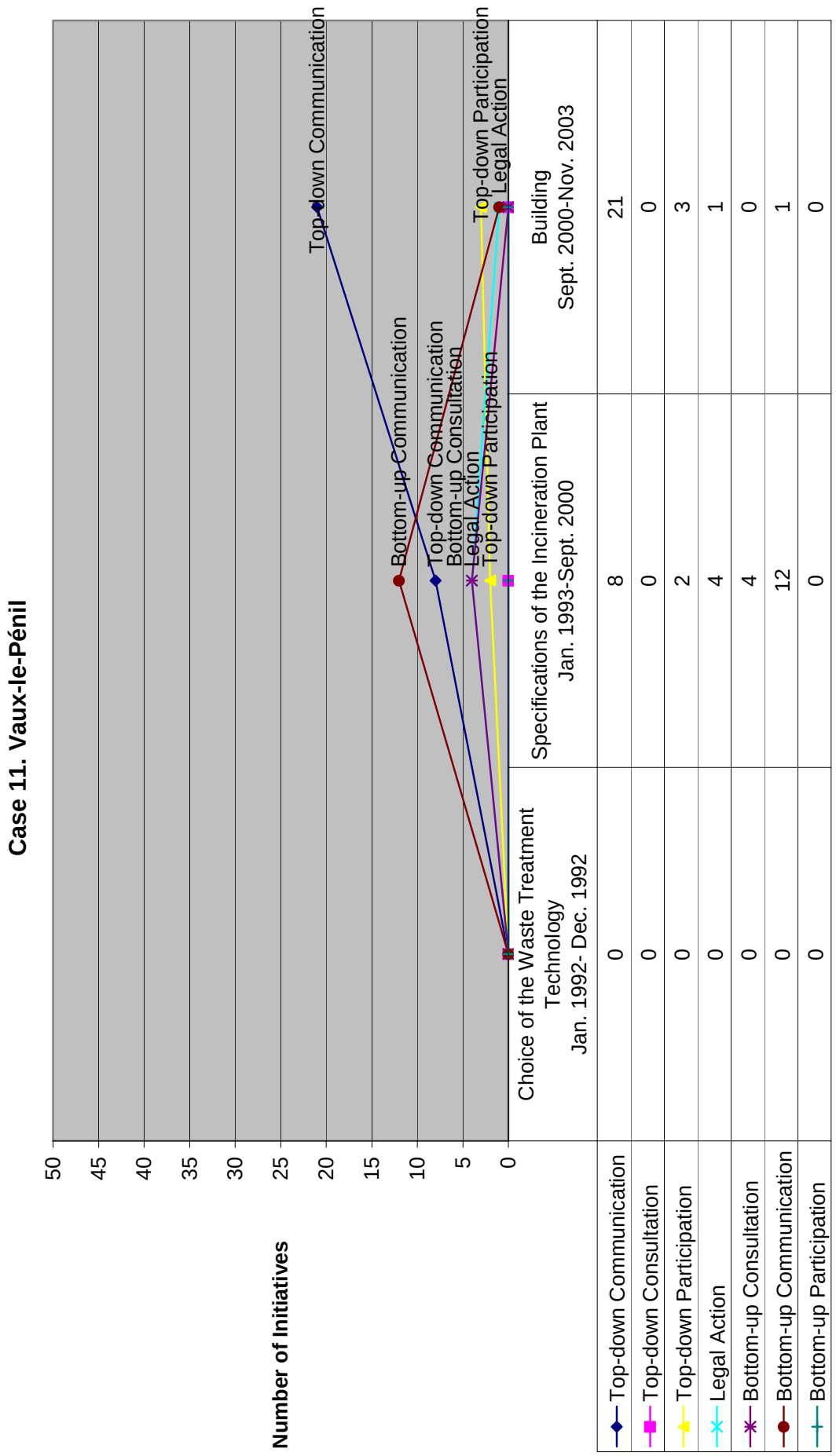

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COLLECTIF INCINER'ÀTORT: NEWSLETTER N°1

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La lettre d'information Collectif Incinér'à tort
www.incinerator.ft.st tel 02 41 76 51 59 – 02 41 41 08 04 – 02 41 76 85 00

2 mai 2005
N° 1

En deux mots

Qui n'entend qu'une cloche, n'entend qu'un son !
La communauté d'Agglo organise toute sa communication sur l'incinération, sans avis contradictoires. C'est pour combler ce vide que nous nous proposons de vous apporter d'autres éléments d'information afin que les élus prennent leur décision en complète connaissance de cause.

Le collectif .

CI-JOINT, UN DVD

Ce dvd vous propose les reportages de l'émission « Compléments d'enquête » de juin 2004 sur FR2, consacrés aux problèmes posés par les incinérateurs en France.
Un éclairage utile à voir ou à revoir au moment où Angers Loire Métropole s'apprête à prendre une décision pour le traitement de ses déchets.

réunions /actions :

11 mai 20h30 : AG du collectif, salle de la Cressonnière à St-Barth
15 mai : fête de Printemps « Incinéra'folies » à St-Barth
17 mai : manif à la mairie de St-Barth pour accueillir Mr Antonini

Et toujours :

Signer la charte :
- sur le site, en ligne
- auprès d'un membre
- à une réunion

Adhérer : 5€/personne
Participer : donner de son temps pour les activités (tractage…)

LE TRI, CA MARCHE !

Dans le grand supermarché de la planète, l'Homme a puisé sans compter sans se préoccuper de recharger les rayons. Il va bientôt avoir épuisé les énergies fossiles. Et dans le même temps, à la différence des autres êtres vivants qui restituent à la nature ce qu'ils consomment, il s'est mis à détruire tous les produits résiduels de sa consommation : envahis par ses « déchets », il s'est mis à les brûler, les transformant en produits toxiques.
C'est ce constat étonnant qui doit nous amener à avoir un comportement écologique : faire en sorte que les matières premières soustraites à la planète lui soient restituées sous une forme ou sous une autre.
Le tri sélectif est la meilleure démarche pour y parvenir. En triant papier, carton, verre, plastiques, métaux, matières fermentescibles, on permet par le recyclage une restitution indirecte qui permet en plus d'économiser la matière première.
En effet, une fois collectés, tous ces produits retrouvent une seconde vie. Savez-vous que les bouteilles transparentes sont transformées en fibres synthétiques destinées au rembourrage de sièges automobiles ou pour faire des pulls ? L'aluminium des boîtes conserve, barquettes ou cannettes sert à la fabrication de pièces de voitures… cela se passe à notre porte, dans le Segréen !
Le compostage individuel des déchets organiques et le tri mécano-biologique apportent des solutions pour transformer les fermentescibles en une ressource précieuse pour enrichir les sols.
L'autre avantage, c'est qu'on allège la poubelle des 2/3 de son poids : les produits résiduels non triés ne représentent plus alors que le 1/3 de la masse initiale. Inertes, leur faible volume peut être enfoui dans un centre d'enfouissement banal de classe 3. C'est autant, voire moins, que ce qui sort de l'incinérateur après traitement sous forme de mâchefers et cendres toxiques et qu'il faut de toutes façons enfouir, mais dans des centres de classe 2 ou 1 beaucoup plus coûteux.
Tout repose alors sur l'écocitoyenneté pour le sérieux du tri -mais avec une bonne communication, on y est partout parvenu- et sur l'organisation des différentes collectes. Là encore, partout où le tri sélectif a été mis en place, des dispositifs ont été trouvé et donnent satisfaction. Il en est ainsi des cagettes de couleur du SISTO (Segréen), de la mise en place des composteurs individuels, des collectes sélectives. Au bout du compte, partout on arrive à des coûts de traitement largement inférieurs à ceux des incinérateurs.

Suite au verso

En bref !

Le Collectif n'affirme pas sans savoir. Il s'informe : visites du centre d'enfouissement de Champteussé-sur-Baconne, du centre de tri mécano-biologique de Launay Lantic, en Côtes d'Armor et de l'usine d'incinération de Lasse. Il informe même Mr Bodard sur la destination des REFIOM de l'incinérateur de la Roseraie.

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La Communauté de Communes des Portes d'Alsace

Tout repose sur l'efficacité du tri et le choix de la collecte au porte-à-porte.
En isolant la matière organique pour le compostage et en triant correctement papiers, verres, cartons, métaux et plastiques flacons, on obtient une valorisation matière de 60% de la masse globale de 371kg/hab/an. La part des résidus non triés s'établit à 27,8%, soit 103kg/hab/an. Le reste (4,6%) est constitué par les encombrants dont la plus grande partie est valorisable. Un volume résiduel donc qui pose moins de problèmes à enfouir que les mâchefers des incinérateurs.

L'implication des ménages dans la réussite du tri a été déterminante. Elle a été obtenue par une campagne de communication dynamique s'appuyant sur des opérations pédagogiques dans les écoles, des réunions publiques d'information, des stages de compostage, des expositions et l'intervention ponctuelle d'une « ambassadrice du tri ». Le dispositif repose sur la fourniture d'un calendrier avec codes couleurs et informations pratiques et la fourniture de documents accessibles au non francophones et la médiation d'associations d'accueil pour les primo arrivants.

Pour augmenter l'incitation, le choix de la pesée embarquée, facile à mettre en œuvre, permet d'établir des factures individuelles pour chaque ménage, avec pour slogan : « plus je trie, plus je permets le recyclage, moins j'ai recours à l'incinération, moins je pollue, moins je paie ! » ; Le prix moyen par habitant et par an de la collecte et du traitement des ordures ménagères pour 2004 a été de 34,84€ ! **Trois fois moins cher que le coût proposé par le projet d'incinérateur de Mulhouse !**

Il ressort que la collecte au porte-à-porte ne coûte pas plus cher avec le tri.
L'adhésion de la population a été particulièrement rapide puisque de 390kg/hab/an en 1991, sans tri, le tonnage est passé à 235kg/hab/an en 1997. En 2004 il en est à 103kg/hab/an. Avec le tri et la pesée embarquée, en 2005, les 525 habitants de Manspach produisent 48t/an de déchets ultimes alors que l'étude faite pour le projet d'incinérateur évaluait le gisement à 400t/an, soit 940kg/hab/an !
Bien entendu, les points d'apports volontaires complètent le dispositif : pour le verre, pour les huiles de vidange, pour les textiles. Pour les piles et batteries, la collecte s'organise avec les écoles et les mairies.

Le Sisto (Segréen)

Le Segréen collecte les déchets en triant et en mettant à disposition des déchetteries (Lion d'Angers, Chazé sur Argos, Saint-Gemmes d'Andigné).
Le tri est effectué uniquement pour le recyclage et propose trois sélections, y compris en ville avec des bacs dans les immeubles :

- une corbeille jaune pour les bouteilles plastiques, les briques alimentaires, les boîtes métalliques et cartonnettes ;
- une corbeille bleue pour les journaux, magazines et prospectus ;
- une corbeille verte pour les bouteilles, bocaux et les pots en verre.

Le ramassage est effectué par un camion compartimenté. Cette collecte prélève 97 kg/hab/an.
Pas de changement pour la collecte de la poubelle habituelle des ordures ménagères. Mais une structure s'est créée pour réfléchir à la collecte des fermentescibles.
Déjà, ce tri sélectif simple a permis de diviser par deux le volume de la poubelle qui part à l'enfouissement au centre de la Champteussé-sur-Baconne (222kg/hab/an). Le prélèvement des fermentescibles diviserait encore par deux ce chiffre.

Pour conclure :
Ces exemples montrent que le tri sélectif ça marche et permet d'éviter l'incinération. Les stratégies sont multiples et toutes applicables en milieu urbain, comme de nombreux exemples à l'étranger nous le montrent. **C'est une question de volonté politique.** La clé de la réussite repose sur la collecte des fermentescibles. Nous vous en parlerons dans le prochain numéro.

NON, Mr NARBONNE, les risques liés à l'incinération ne sont pas globalement maîtrisés. Les normes en évolution constantes en sont la preuve et elles ne sont qu'un droit réglementaire à polluer moins. Il sort des cheminées des incinérateurs des milliers de molécules qui n'ont pas encore été étudiées. Comme les dioxines en son temps jusqu'au moment où…! La diminution des pollutions n'est spectaculaire qu'en apparence et la multiplication des incinérateurs continuera d'aggraver les choses.

Comité de Rédaction : Marie Conan, Jacques Lemarquand, Gilles Micheneau, Daniel Houlle

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SOURCES OF DATA

In the first section, this annexe lists, for each case, all the interviewees, documents and web site edited by the public authorities and by the NGOs. In the second one, the secondary literature can be found.

I. Interviews and Documents

Case1. Gueugnon

Interviews:

Public authority:

- Grouping of *communes* : mixed syndicate SMEVOM du Charolais-Brionnais et Autunois

NGOs:

- *VPIG*
- *Autun Morvan Ecologie*

Documents:

Grouping of *communes*:

- Web-site : www.smevom.fr last access 19/08/2007; http://www.ville-gueugnon.fr/ville/delib.htm last access 19/08/2007
- Minute of the town council of Gueugnon 03/05/2002
- Minute of the town council of Gueugnon 28/11/2002
- Minute of the town council of Gueugnon 20/12/2002
- Minute of the town council of Gueugnon 30/01/2003
- Minute of the town council of Gueugnon 19/12//2003
- Minute of the town council of Gueugnon 25/03/2004
- Minute of the town council of Gueugnon 08/07/2004
- Minute of the town council of Gueugnon 23/09/2004

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- Minute of the town council of Gueugnon 18/11/2004
- Minute of the town council of Gueugnon 24/03/2005
- Minute of the town council of Gueugnon 25/00/2006

NGOs: -

Other:
- Le Journal de Saône et Loire 03/04/2005
- Le Journal de Saône et Loire29/03//2005

Case 2. Angers

Interviews:

Public authority
- Grouping of *communes*: Urba community *Angers Loire Métropole*

NGOs:
- *Angers Roseraie Environement* (*AREN*)
- *Collectif Incinér'a'tort*: 2 interviewees
- *Sauvegarde de l'Anjou:* No answer

Documents:

Grouping of *communes* (Angers Loire Métropole):

- Newsletters of 'Angers Loire Métropole':
  - power point presentations used on meetings
  - web-site: http://www.angersloiremetropole.fr/domaines_intervention/environnement/dechets.htm http://www.angersloiremetropole.fr/telechargement/telechargement_environnement.htm
  - Minutes of the "comités de pilotages" in charge of the waste treatment project

NGOs:

- *AREN*:
  - "Emissions aériennes d'oxydes d'azote", observations de l'*AREN* à la CLIS, 13 September 2005 (ATLAS-ti Primary Document P 16)
  - "Usine d'Incinération, La requalification: un expedient à hauts risques", press release, 12 January 2004 (ATLAS-ti Primary Document P 15)
  - "Usine d'Incinération, L'*AREN*, acteur de la démocratie participative locale", press release, 10 october 2003 (ATLAS-ti Primary Document P 14)
  - "Mémo réunion publique 20 avril 2004", minute of the NGO's speech at a public meeting sponsored by the public authority, 20 April 2004 (ATLAS-ti Primary Document P 13)
  - "Mémo Réunion assos 7 avril 2004", minute of the NGO's speech at a public meeting sponsored by the public authority, 7 April 2004 (ATLAS-ti Primary Document P 12)
  - "Lettre ouverte à Monsieur le president de la commnauté d'agglomération d'Angers", open letter, 23 May 2003 (ATLAS-ti Primary Document P 11)
  - "à Monsieur le Président du conseil de développement du Pays et de l'agglomération d'Angers", letter to the conseil de développement, 29 March 2004 (ATLAS-ti Primary Document P 10)

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- "Incinération des Déchets, l'*AREN* sort de son silence", press release, 15 April 2005 (ATLAS-ti Primary Document P 9)
- "Usine d'Incinération, pour l'*AREN* : la raison l'a finalement emporté !", press release, 12 May 2004 (ATLAS-ti Primary Document P 8)
- "Feuille de route pour les élus de l'agglo d'Angers", minute of the NGO's speech at a public meeting sponsored by the public authority, 27 May 2005 (ATLAS-ti Primary Document P 7)
- "Usine d'incinération de la roseraie, tribunal administrative: l'*AREN* obtient gain de cause dans un long contentieux d'urbanisme", press release, 2 January 2002 (ATLAS-ti Primary Document P 5)
- "Usine d'incinération de la roseraie: imprévoyance ou mauvais calcul ? », press release, 21 March 2003 (ATLAS-ti Primary Document P 4)
- "*Usine d'incinération, pourquoi ne pas dire la vérité aux Angevins*?", press release, 22 April 2003 (ATLAS-ti Primary Document P 3)
- "Usine d'incinération de la roseraie, fonctionnera-t-elle après le 28 décembre 2005 ? demande l'*AREN*", press release, 23 June 2003 (ATLAS-ti Primary Document P 2)
- "*Cadre de vie, santé environnement*", press release, 28 December 2003 (ATLAS-ti Primary Document P 1)

- Collectif Incinér'a'tort
  - Newsletters from number 1 (May 2005) to 9 (January 2006)
  - web-site: http://www.incineratort.com
- Sauvegarde de l'Anjou

Web site: http://perso.orange.fr/sauvegarde.anjou/

Case 3. Thiviers

Interviews:

Public authority:
- Grouping of *communes*: mixed syndicate SMD3

NGOs:
- *Thiviers-la-Vie*
- *Collectif Halt'Incin*

Documents:

Grouping of *communes*:
- Web-site : http://perso.orange.fr/geotrie/

NGOs:

Thiviers-la-Vie :
- Web-site : http://www.thiviers.fr/thivierslavie/actualites.html

Collectif Halt'incin: Lettre de Halt'incin N°1 to N°31
Other:

Web site: http://www.incinerateur-bergeracois-danger.ouvaton.org

Case 4. Arras

Interviews:

Public authority:

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- Grouping of *communes*: mixed syndicate SMAV

NGOs:
- Nord Nature : no interview

Documents:

Grouping of *communes*:

Communauté Urbaine d'Arras: http://www.cu-arras.fr/index2.php?rub=missions&page=8

NGOs:

Web site: www.nord-nature.org/

Case 5. Lasse

Interviews:

Public authority:

- Grouping of *communes*: mixed syndicate SIVERT
- Municipality of *Lasse*

NGOs:

- *CRITOM*
- Sauvegarde de l'Anjou: No answer

Documents:

Grouping of *communes*:
- Press articles
- Web-site: http://www.sivert.fr

NGOs:

- *CRITOM*: leaflets, press articles
- Sauvegarde de l'Anjou

Web site: http://perso.orange.fr/sauvegarde.anjou/

Case 6. Le Havre (St-Jean-De-Folleville)

Interviews:

Public authority:

- Grouping of *communes*: mixed syndicate SEVEDE

NGOs:

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- *Comité du quartier des Neiges*
- *SOS Estuaire*
- *Ecologie Pour Le Havre*

Documents:

Grouping of *communes*:

- Web site : www.sevede.fr

NGOs:
Web sites : http://sos.estuaire.free.fr/ ; http://eplh.free.fr/

Case 7. Nîmes

Interviews:

Public authority:

- Grouping of *communes*: mixed syndicate SITOM SUD GARD

NGOs:
No interview

Documents:

Grouping of *communes*:

- Web site : www.sitom-sud-gard.com

NGOs:

Web site : http://reseau-ecoforum2.chez-alice.fr/ICIROM/IciRom.htm

Case 8. Villers-Saint-Paul

Interviews:

Public authority:
- Grouping of *communes*: mixed syndicate SMVO

NGOs:
- *Alerte aux Déchets*
- Compiègne écologie

Documents:

Grouping of *communes*:

- Web-site : www.smvo.fr

NGOs:

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Web site: www.alerteauxdéchets.org

Case 9. Calce

Interviews:

Public authority:

- Grouping of *communes*: mixed syndicate SYDETOM66

NGOs:

- Coordination Environnementale de Traitement des Déchets des Pyrénées orientales
- *La Hune*

Documents:

Grouping of *communes*:

Web site : http://www.sydetom66.com

NGOs:

Case 10. Evreux-Guichainville

Interviews:

Public authority:

- Grouping of *communes*: mixed syndicate SETOM

NGOs:

- Association Seine et Marnaise pour la Sauvegarde de la Nature : President Ms Gilloire

Documents:

Grouping of *communes*:

- Web site : www.lombric.com

NGOs:

ASNSM : Association Seine et Marnaise pour la Sauvegarde de la Nature

Web site : www.asnsm.org

Case 11. Vaux-le-Pénil

Interviews:

Public authority:

- Grouping of *communes*: mixed syndicate SMITOM

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NGOs:

- *ASMSN: Association Seine-et-Marnaise pour la Sauvegarde de la Nature*
- *Association des Médecins de Maincy*
- *Un autre regard pour Maincy*
- *AVIE: Association de défense des Victimes de l'Incinération des Déchets*
- *AIPPNE: Association Intercommunale pour la Protection et la Promotion de la Nature et de l'Environnement*

Documents:

Grouping of *communes*:

- Web site : www.lombric.com

NGOs:

ASNSM : Association Seine et Marnaise pour la Sauvegarde de la Nature

Web site : www.asnsm.org

II. Secondary Litterature

Organisations

ADEME, www.ademe.fr

Ministère de l'Ecologie et du Développement durable, MEDD : www.environnement.gouv.fr

IFEN, Institut français de l'environnement, Données de l'Environnement, www.ifen.fr

FEDEREC, Fédération Française de la Récupération pour la gestion industrielle de l'environnement et du recyclage, www.federec.com

FNADE, Fédération Nationale de la Dépollution et de l'Environnement, www.fnade.com

INERIS, Institut National de l'Environnement Industriel et des Risques, www.ineris.fr

ECO-EMBALLAGES, www.ecoemballages.fr

ADELPHE, www.adelphe-recyclage.com

AMF, Association des Maires de France, www.amf.asso.fr

AMORCE, Association de collectivités et de professionnels, www.amorce.asso.fr

Greenpeace France: www.greenpeace.fr

WWF France: www.wwf.fr

CNIID: www.cniid.org

COFRAC http://www.cofrac.fr/Cofrac_en.htm

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Internet Web Sites

Droit français : www.legifrance.gouv.fr, http://admi.net, www.senat.fr, http://aida.ineris.fr, www.recup.net/legislation.html,

Portail européen de l'environnement, http://www.enviro2b.com/france

Veille environnement, http://www.terrabilis.com/

Actualités déchets : www.dechetscom.com, www.environmentdaily.com

Information & service environnement, www.pro-environnement.com

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ADEME, "Gestion des déchets: France", avalaible at: http://www.ademe.fr/ademeurope/liredocument.asp?lien=upload/FRANCE0303.pdf, access date: May 2005

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